ADEQ

ARKANSAS
Department of Environmental Quality

May 3, 2004

The Arkansas Department of Environmental Quality (ADEQ), in conjunction with local elected officials, has established a process whereby ADEQ will solicit proposals from prospective purchasers to redevelop or operate the former Cedar Chemical Company and to address the existing environmental contamination at the site.

Cedar Chemical Company, which produced herbicides and pesticides at the West Helena facility, ceased operations and filed for bankruptcy in March 2002, leaving behind a site with environmental contamination, including soil and sub-soil contamination on the property and groundwater contamination that extends beyond the property boundaries. As dictated by the bankruptcy court, ADEQ has secured the property to limit further environmental contamination, and has overseen the site since October 2002. As part of the bankruptcy decree, ADEQ will direct Cedar Chemical Company to transfer ownership of the West Helena property to an ADEQ-selected buyer. The facility consists of six (6) separate processing units, laboratories, a finished goods warehouse, a stormwater pond, a wastewater treatment plant, a spare parts warehouse, a maintenance shop, an administration building and various other buildings on 48 acres.

Your company has shown an interest in this property and therefore you are being notified that ADEQ is formally soliciting proposals from prospective purchasers who are interested in redeveloping or operating the facility and addressing environmental contamination at the site.

In order to limit a prospective purchaser's liability, ADEQ recommends that anyone interested in redeveloping the site enter into the Arkansas Brownfields Program. The letter of intent guidance and an Arkansas Brownfields application can be found in Attachment A of this packet. The application will be reviewed to determine eligibility for the program. ADEQ has prepared a comprehensive site assessment that identifies and characterizes the contamination and environmental concerns at the site (Attachment B), and has received an independent appraisal of the property's value (summary can be found in Attachment C). The property and equipment are valued at approximately $6.4 million, before considering the reduced value because of the environmental contamination at the site. A risk evaluation report has also been included as Attachment D. It explains the risk to groundwater degradation and to human health and the environment. ADEQ will continue working with the Arkansas Department of Economic Development (ADED) to evaluate redevelopment and economic development options for the facility.

ADEQ in conjunction with ADED will evaluate the proposals based on the prospective purchaser's ability to address both redevelopment and environmental issues to determine if the proposals satisfy the needs of the community for addressing the on- and off-site environmental contamination, and returning the site to productive use. Proposals must follow the format established by the Prospective Purchaser's Ranking Criteria (Attachment E). This document addresses business viability, redevelopment, employment, community involvement, plans to address risks associated with clean up or contain soil and sub-soil contamination at the site (as related to specific uses of the property), off-site groundwater contamination, and to limit further groundwater degradation.

June 1 and June 29, 2004 will be the only two dates offered to prospective purchasers to tour the facility. These tours will be overseen by ADEQ staff. **Appointments must be scheduled at least one week prior to the preferred tour date.** If no appointments are made, ADEQ staff will not be at the site to allow admittance onto the property.

Proposals must be sealed and marked "Cedar Chemical Redevelopment Proposal Enclosed." All proposals are due to ADEQ no later than 2:00 p.m. on August 2, 2004. The proposals will not be opened until after the deadline has expired.

Prospective purchasers are encouraged to visit http://www.adeq.state.ar.us/cedarchemical.htm or contact Amanda Gregory at (501) 682-0867 or gregory@adeq.state.ar.us for further information.

HAZARDOUS WASTE DIVISION
8001 NATIONAL DRIVE / POST OFFICE BOX 8913 / LITTLE ROCK, ARKANSAS 72219-8913 / TELEPHONE 501-682-0833 / FAX 501-682-0565
www.adeq.state.ar.us

CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

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CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

ATTACHMENT A

LETTER OF INTENT GUIDANCE

-AND-

BROWNFIELDS APPLICATION FORM

LETTER OF INTENT GUIDANCE
ADEQ Brownfields Program

Background: Arkansas Code 8-7 Subchapter 11 was amended on February 9, 2001 and became effective on August 13, 2001, to include the provision allowing property transactions and transfer of title prior to completion of the actions contemplated at 8-7-1104 (b) - (d) by persons not previously involved with the site or otherwise considered a responsible party for environmental conditions at a site. Therefore, such parties, at the discretion of the director, may submit a Letter of Intent that will set forth the party's desire to purchase the site and retain their eligibility for participation in the Voluntary Cleanup program established by Subchapter 11.

Guidance: The following guidance is provided to assist a potential purchaser with the preparation of the Letter of Intent and initiate the process of entering into the Arkansas Brownfields Program.

Letter of Intent (example of content):

Subject: Notice of Intent to Purchase [**identify property**]

The [**prospective purchaser company name**] intends to purchase [**property name**] and request to retain its eligibility for participation in the Brownfields Program established under A.C.A. 8-7-1101 et seq. The undersigned, is the [**title**] of [**pp company name**], acknowledges that [**pp company name**] did not by act or omission cause or contribute to any release or threatened release of a hazardous substance on or from the identified site or is otherwise considered to be a responsible party pursuant to A.C.A. 8-7-512(a)(2)-(a)(4).

The subject property is located [**provide directions**] and is legally described as follow: [**provide legal description of the property**].

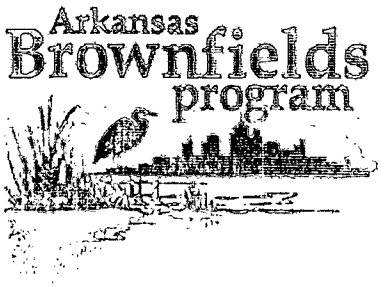
[**pp company name**] intends to acquire the property by [**list date**]. A comprehensive site assessment (CSA) shall be completed and the results submitted to the Arkansas Department of Environmental Quality (ADEQ) within 60 to 90 days follow the purchase date. Upon the review and approval of the CSA by ADEQ, [**pp company name**] commits to enter into a Brownfields Program implementing agreement with ADEQ.

Completing the Process:

The attached application and the Letter of Intent should be sent to:

Chris C. Hemann
Inactive Sites Branch Manager
ADEQ, Hazardous Waste Division
8001 National Drive, P.O. Box 8913
Little Rock, Arkansas 72219-8913

For more information, please call (501) 682-0854 or e-mail brownfields@adeq.state.ar.us



APPLICATION FORM
ADEQ Brownfields Program

Instructions: Please type or print clearly. Pages may be added for any additional information where space is limited.

Applicant Information

Applicant Name: _____

Applicant Business: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ County: _____

Contact Name (if different than Applicant Name): _____

Telephone: _____ Fax: _____

E-mail: _____

Property / Facility Information

Property / Facility Name: _____

Street Address: _____

City: _____ State: _____ Zip: _____ County: _____

Property Size (acres): _____

Latitude: _____ Degrees _____ Minutes _____ Seconds

Longitude: _____ Degrees _____ Minutes _____ Seconds

Location of Property / Facility: _____

_____

_____

Legal Description of Property / Facility: _____

_____

_____

Are there any storage tanks located at this property? _____

If YES, please complete the information requested below:

1. Owner's name: _____
2. Facility name: _____
3. Number of tanks: _____
4. Date(s) installed: _____
5. Capacity: _____
6. Substance stored: _____
7. Status of tank(s) ("in use" or "not in use"): _____

Previous Involvement with Property and Planned Usage

Has the applicant been actively involved as owner/operator of the facility at any time? _____

If YES, in what capacity? _____

Did the applicant generate any hazardous substances disposed of at the facility? _____

Did the applicant transport any hazardous substances disposed of at the facility? _____

Did the applicant have any business associations with previous owner/operators of the facility? _____

If YES, please describe: _____

What is the intended use for this property? _____

Has a site assessment (Phase I or Phase II) been completed on this property? _____

If YES, please provide dates: _____

Historic Uses of the Property

_____

_____

_____

_____

_____

Ownership History (If Known)

_____

_____

_____

Waste Types (If Known)

e.g., chemicals used at the site or waste produced at the site

_____

Regulatory Involvement (If Known)

Has the facility ever held an environmental permit (e.g., hazardous or solid waste, air, water)? Was there any enforcement or investigation activity?

Schedule of Events

Letter of Intent to set forth the applicant's desire to purchase the property and retain their eligibility for participation in the Arkansas Voluntary Cleanup Program (Date): _____

Property acquisition schedule (list of activities and dates): _____

Tentative Comprehensive Site Assessment start date: _____

Certification of Truthfulness

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information in this application, the information submitted is to the best of my knowledge and belief true, accurate, and complete.

_____ _____

Signature Date

_____

Title

_____

Corporation Name

Please Return This Form To:

Arkansas Department of Environmental Quality
Arkansas Brownfields Program / Hazardous Waste Division
8001 National Drive / P.O. 8913
Little Rock, Arkansas 72219-8913

For More Information, Please Contact:

Amanda Gregory
ADEQ Brownfields Coordinator
Phone: (501) 682-0867
E-mail: brownfields@adeq.state.ar.us

CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

ATTACHMENT B

COMPREHENSIVE SITE ASSESSMENT

COMPREHENSIVE SITE ASSESSMENT

CEDAR CHEMICAL CORPORATION PLANT SITE

ARKANSAS HIGHWAY 242
WEST HELENA, ARKANSAS

ARD 990660649

Prepared for:

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

BROWNFIELD PROGRAM

AFIN	54-0068
Project Code	1527

MAY 2003, REVISED APRIL 2004

Executive Summary

Extensive investigations have been conducted at Cedar Chemical Corporation (CCC) facility in West Helena, AR, prior to bankruptcy. The investigation data has been evaluated through a risk assessment process. Potential owner/operators have inquired with ADEQ to reuse the site for various manufacturing process utilizing the existing facilities. ADEQ prepared this Comprehensive Site Assessment (CSA) for disclosure of known environmental site conditions to potential operators. This CSA also provides an overview of the general plant operational conditions as they may relate to environmental issues associated with future operations.

Apparent Risks Associated with New Operations

The 1999 Risk Assessment quantitatively evaluated the inhalation of volatiles and dust, incidental ingestion, and dermal contact with surface/subsurface soil, and incidental ingestion and dermal contact with perched groundwater exposure pathways for a future onsite construction worker population. A substantially high risk to future construction workers was indicated at Sites 1,2,3,4, and 9. Site 5 should also be considered a substantial risk if the building was to be removed or replaced.

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion and dermal contact with surface soils exposure pathways for current/future onsite worker populations. A substantially high risk to onsite workers was indicated at Site 9. Onsite workers historically rarely worked in this area, but did work inside buildings located on this disposal site. Indoor air pathways were not evaluated in the risk assessment.

Site 5 Drum Vault has many uncertainties remaining after the investigations and risk assessment was complete. The contents of the drums are unknown and therefore there is no certainty in what the associated risks may be as they relate to onsite workers.

Associated risks could be managed during construction activities using personal protective equipment and best management practices. A soil management plan for construction activities should be developed for all construction activities by any new owner/operator. Institutional controls could be implemented to minimize risk through restricted access.

Future Release Potential from New Operations

ADEQ personnel have observed the plant during site visits since abandonment. These observations are relevant to any future operations where future releases are of concern.

Waste Water Treatment Plant

The associated ponds were originally constructed in 1977 with a clay-like additive mixed with native soil and compacted to form liners for the ponds. Sludges were not removed from the ponds. In the event that sludge is removed from the ponds, it is likely that the liners may be damaged. It is also likely that clay materials may break down or become more permeable upon sustained contact with certain organic and chlorinated organic compounds. Groundwater

mounding has been reported around the WWTP and contaminants have been reported in groundwater samples. The WWTP may actively leak into the groundwater. Future operators should at a minimum monitor groundwater around the WWTP to show that new operations are not causing further groundwater degradation or consider retrofitting the ponds with synthetic liners and leak detection capabilities.

Tank Secondary Containment Areas

ADEQ personnel observed the tank containment areas during precipitation events since abandonment. Several containment areas were observed not to accumulate precipitation or had active leakage observed. Containment areas that fail to hold stormwater will not contain a spill event. The investigations conducted indicated significant contamination at Site 4. Future operators should repair or reconstruct tank secondary containment areas that are not capable of containing a spill to minimize the potential of further degradation.

Process Containment Areas

Each of the process units has curbing around the concrete pads and sumps that are designed to contain releases. Curbing has been observed actively leaking during precipitation events and would perform similarly during a release event. Process sumps are used to collect released materials where they are pumped to the WWTP. Process sumps are typically made from concrete that tends to crack and form a release pathway into soils and/or groundwater. Both soil and groundwater around the process units were determined to be contaminated in facility investigations. Future operations should consider improvement to containment areas and process sumps to minimize the potential for further degradation.

Underground Piping

Underground piping was determined to be a major source of contamination in the facility investigations. Most of the underground piping was replaced by CCC, with the exception of wastewater piping beneath Industrial Park Drive to the WWTP. It is unknown if this underground piping has leak detection capabilities. Future operations should consider the elimination of underground wastewater piping to minimize the potential for further degradation.

Continuing Release Potential from Previous Operations

The majority of the sites identified in the facility investigations should be considered continuing sources of contamination to stormwater and groundwater, due to the fact remediation or stabilization were not completed by CCC before bankruptcy.

Stormwater sampling (conducted by ADEQ) shows contamination results during each precipitation runoff event. New operators will be responsible for managing stormwater in future NPDES permitting scenarios. Stormwater management may also play a significant role in controlling continuing releases to groundwater. Excessive stormwater retention at the site likely mobilizes contaminants from soils into an aqueous phase that either runs off or permeates the

ground eventually entering the alluvial aquifer. Future stormwater management should minimize stormwater retention to minimize the potential for further degradation.

Risk Potential of Offsite Groundwater

The 1999 *Risk Assessment* quantitatively evaluated agricultural workers inhalation of volatile organic compounds released from the alluvial aquifer during irrigation. A substantially high risk to agricultural workers was indicated, based upon maximum detections. The 2001 *Risk Assessment Addendum* quantitatively evaluated agricultural workers inhalation of volatile organic compounds released from the alluvial aquifer during irrigation to, using actual data obtained from impacted irrigation wells. An acceptable risk to agricultural workers was indicated, but remains uncertain for future groundwater plume movement.

Potential Risk To Indoor Air Through Vapor Intrusion Into Buildings

The indoor air pathway was not evaluated in the 1999 *Risk Assessment* or the 2001 *Risk Assessment Addendum.* Based on the presence of volatile constituents of concern detected in the shallow soils and groundwater in and around the building(s) and dependent upon the proposed use of the building(s), it is recommended any proposals for reuse/redevelopment evaluate the potential risk to indoor air through vapor intrusion. ADEQ has access to shallow soil and groundwater data from the site which could be used to evaluate the potential for vapor intrusion concerns.

Conclusions

Potential risks associated with the site are considered manageable from the perspective of onsite workers and future construction workers scenarios. The site is suitable for continued use in an industrial setting.

The results of historical operations are likely to further contribute to stormwater and groundwater contamination, until the site is stabilized, remediated, or contaminants are eventually diluted.

Potential risks to offsite agricultural workers depend on the irrigation practices and movement of the contaminant plume. Such risk could be managed if water use could be controlled, the plume remained stable, or if active remediation of groundwater was used to cut off uncontrolled contaminant migration.

Potential risks from exposure to indoor through vapor intrusion into buildings are unknown.

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EPA Action Memo

1.0 Introduction

ADEQ assumed control of the site on October 18, 2002, when abandonment was authorized by a bankruptcy court in the State of New York. ADEQ issued Emergency Order of the Director LIS 02-148 to address the emergency situation. The agency is providing security, until certain activities are completed, and will provide stormwater operations and maintenance indefinitely through funding provided from the Remedial Action Trust Fund. The site has been listed as a State priority site.

ADEQ is the lead agency for the site. ADEQ is working closely with other agencies, such as the Arkansas Department of Economic Development to redevelop the property into uses that are beneficial to the surrounding community. The Brownfield program provides a mechanism to limit the liability of a new owner/operator for the redevelopment of previously contaminated property that was caused by previous owner/operators. The Hazardous Waste Division of ADEQ is leading site stabilization and redevelopment efforts.

The objectives of this project are to provide disclosure of all investigations related to environmental contamination conducted at the site to potential purchasers of the site. This report also provides information on the current status of the plant that will assist potential operators in addressing environmental issues that relate to the Brownfield program.

2.0 Intended Land Use

The site is intended to remain industrial use when redeveloped. The site may not be suitable for residential development or other non-industrial uses due to environmental contamination.

3.0 Site Description

SIC Description: Organic Chemical Plant
SIC Code: 2869

Agricultural and organic chemicals manufacturing including insecticides, herbicides, polymers, and organic intermediates were manufactured within six production units at the facility. In addition to chemical production, plant activities included product formulation and packaging. Chemical production occurred in batches and fluctuated based on the season. New products were frequently introduced into production. Chemical processing at the production units included alkylation, amidation, carbamoylation, chlorination, distillation, esterification, acid and base hydrolysis, and polymerization (Environmental and Safety Designs, 1996).

3.1 Location

The former Cedar Chemical Corporation (CCC) West Helena Plant is located just to the south of Helena and West Helena, Arkansas. The plant is located within the Helena-West Helena Industrial Park, approximately one and one quarter mile southwest of the intersection of U.S. Highway 49 and State Highway 242.

3.2 Description of Current Conditions

CCC is currently bankrupt and manufacturing operations were shut down on March 8, 2002. The site was abandoned through a bankruptcy court in the State of New York on October 18, 2002. ADEQ issued Emergency Order of the Director LIS 02-148. ADEQ assumed site security and environmental management immediately upon abandonment. ADEQ is currently managing stormwater from the site through the existing wastewater treatment facility and discharge through the NPDES permitted outfall to the Mississippi River, maintaining essential utilities for environmental operations and maintenance, and providing security until the emergency situation is abated.

Stormwater accumulates on site during rain events and requires pumping to the wastewater treatment plant (to prevent uncontrolled discharges) and to the Mississippi River (for disposal). ADEQ periodically collects stormwater samples. Sample results confirm the presence of volatile and semi-volatile compounds in stormwater. Stormwater becomes contaminated upon contact with contaminated soils.

Manufacturing areas production units and some tanks were placed in mothball status by plant personnel prior to abandonment. Mothball status was achieved by removing raw materials, products, waste materials, and cleaning certain process equipment, piping and tanks. The extent of decontamination prior to abandonment was not well documented. USEPA Region 6 initiated an emergency removal of hazardous materials contained in piping, tanks and containers during the summer of 2003.

Approximately 6 drums of sodium hydroxide for use in water treatment and several drums of oil remain in the warehouse

Quality Control Laboratory chemicals and R&D laboratory chemicals were abandoned with the plant. USEPA Region 6 initiated an emergency removal of hazardous materials contained in piping, tanks and containers during the summer of 2003.

R&D laboratory underground waste storage tank (sump) currently contains waste materials of unknown composition and quantity. Historical operations pumped these wastes directly to the WWTP. The tank is presumed to accumulate all laboratory drains.

Wastewater treatment ponds currently contain contaminated stormwater, wastewater, and sludges. Water contained in the polish pond is stormwater from the plant runoff. Water contained in the equalization and biological ponds are primarily stormwater from the plant and some process wastewater residual. Process wastewater residual sludges have not been removed from the ponds.

Tanks containing potentially hazardous materials may be present on site. The extent of decontamination prior to abandonment was not well documented. USEPA Region 6 initiated an emergency removal of hazardous materials contained in piping, tanks and containers during the summer of 2003.

Secondary containment areas may contain stormwater. ADEQ does not actively manage all stormwater accumulated in secondary containment, and process containment areas. Equipment for pumping secondary containment and process containment areas abandoned at the site is mostly inoperable.

A number of personal property leased equipment has not been removed from the site including: forklifts, copiers, phone system, two 0.79 cubic foot mixed bed deionized water tanks. A complete list of leased equipment remaining on the site is not available.

All plant records (paper and electronic) remain onsite in the locations of abandonment.

3.2.1 Size of Site

The plant is located on 48 acres of the Helena-West Helena Industrial Park, approximately one and one quarter mile southwest of the intersection of U.S. Highway 49 and State Highway 242. The CCC plant property is divided into two major areas: the manufacturing area and the wastewater treatment system area. Industrial Park Road divides the two areas. The manufacturing area is about 30 acres.

3.2.2 Surface Property Improvements

Electrical service to the plant is provided by the Woodruff Electric Cooperative. There were 16 electrical service meters in use at the plant at the time ADEQ assumed site operations and up to 21 meters were reported by plant personnel. Eight meters were shut off at the direction of ADEQ in effort to reduce operation and maintenance costs. One additional meter was shut off by the Woodruff Electric Cooperative, due to apparent equipment problems. Seven meters are currently in service.

Water for the plant is supplied by the cities of Helena and West Helena through four entry metering points. One meter was shut off by the city due to concerns with contaminated soils and the absence of a backflow prevention valve. ADEQ currently uses two water meters for operations. The plant has a diesel powered firewater booster pump station.

The stormwater retention basin is designed to contain all runoff from the manufacturing area of the plant. The design capacity is 2.6 million gallons and was reported to be capable of containing up to 6.8 inches of precipitation. Two electrical stormwater pumps transfer water to the WWTP through underground piping.

The wastewater treatment plant (WWTP) is located across Industrial Park Drive from the manufacturing area. It consists of an eight million gallon equalization, a six hundred thousand gallon biological treatment, and a four million gallon polish ponds that are approximately 15 feet deep. The amount of sludge accumulated in each pond is unknown. The ponds were originally constructed in 1977 with a clay-like additive mixed into native soils and compacted for lining the ponds. Two electrical pumps with a combined capacity of 134 gpm

connect the treatment ponds to a 4.5-mile underground pipeline to the Mississippi river for discharge through a permitted outfall. The polish pond has a 4 million gallon design capacity.

3.2.2.1 Buildings

Onsite buildings include an Office Complex, a R&D Laboratory, a QA/QC Laboratory, various warehouse buildings, employee changing station, truck scales, and various process control rooms. ADEQ procured services for real estate and equipment appraisals.

3.2.2.2 Above Ground Storage Tanks

ADEQ personnel made observations of above ground storage tanks and secondary containment areas during site visits. Observations are listed on the table below. Leak potential from the containment areas were ranked as high, medium, or low based upon observations of stormwater accumulation in the containment areas.

Tank Observations and Containment Leak Potential

Tank ID	Product Stored	Stormwater Containment Status	Shared Containment	Leak Potential
Unit 1	Process	Little Accumulation	Yes Process Unit	Moderate
Unit 1	Empty Tank Containment	No accumulation	Yes	High
Unit 2	Process	No Accumulation	Yes Process Unit	High
Unit 5	Process	Stormwater Accumulates	Yes Process Unit	Moderate
T5403	?	No Stormwater		High
T5204	Acedic Anhydride	Stormwater Accumulates		Low
T5203	Methanol	Stormwater Accumulates		Low
T5402	Formaldehyde	Stormwater Accumulates		Low
T5201	Sulfuric Acid	Stormwater Accumulates		Low
Unit 4	Process	Stormwater Accumulates		Low
T4208	Nitric Acid	Stormwater Accumulates		Low
T4205	?	Stormwater Accumulates		Low
T4201	Caustic Scrubber	Stormwater Accumulates		Low
T4213	20%Caustic Soda	Stormwater Accumulates		Low
T4212	Methanol	Stormwater Accumulates		Low
T4203	Acifluorfen	Stormwater Accumulates		Low
T1202	?	Stormwater Accumulates		Low
Unit 3	Process	No Stormwater		High
T1204	?	No Stormwater		High
T1201	Telene Waste	Active Leakage		High
T1226	Red Hydrobromic Acid	Little Accumulation		Moderate
T1230	?	Little Accumulation		Moderate
T1212	Kerosene	Little Accumulation	yes	Moderate
T3216		Little Accumulation		Moderate

Tank ID	Product Stored	Stormwater Containment Status	Shared Containment	Leak Potential
?	?	Little Accumulation		Moderate
T1206	Caustic Scrubber	Little Accumulation		Moderate
T1224	Acetic Acid	Little Accumulation		Moderate
T2212	Emulsifier	Little Accumulation	yes	Moderate
T3208	DCPI	Little Accumulation		Moderate
T1228	Emulsifier Vent Tank	Little Accumulation		Moderate
T2205	Propionic Acid	Little Accumulation		Moderate
T2206	Propionic Anhydrite	Little Accumulation		Moderate
T2211	Sun Oil	Little Accumulation		Moderate
T2209	Isophorone	Little Accumulation		Moderate
T2210	ISO MIBK	Little Accumulation		Moderate
T1225	Wash Solution	Stormwater Accumulates		Low
T1222		Stormwater Accumulates		Low
T2207	Tenneco	Stormwater Accumulates		Low
T1219	Toluene	Little Accumulation		Moderate
T1229	?	Stormwater Accumulates		Low
T2202	Propanil	Stormwater Accumulates		Low
T2203	Propanil	Stormwater Accumulates		Low
T2204	?	No Stormwater		High
T2200	Propanil	Stormwater Accumulates	Yes	Low
T2201	?	Stormwater Accumulates		Low
T2217	Propanil Tech	Stormwater Accumulates		Low
T2214	Propanil Flake Melt	Stormwater Accumulates		Low
T2213	?	Stormwater Accumulates		Low
Unit 6	DCA Plant	Stormwater Accumulates	Yes	Low
T6203	?	Stormwater Accumulates		Low
T6204	?	Stormwater Accumulates		Low
T6202	?	Stormwater Accumulates		Low
T6201	?	Stormwater Accumulates	Yes	Low
T0223	Calcium Chloride	Stormwater Accumulates		Low
T6210	?	Stormwater Accumulates		Low
?	?	Stormwater Accumulates		Low
T6205	?	Stormwater Accumulates		Low
Unit 7	Therminol	NA		NA

Note: Shared containment means there are no containment divisions between tanks.

3.2.2.3 Disposal Areas

The maintenance warehouse (Site 5 in FI, SWMU 72 RFA) building foundation was constructed as a waste disposal vault in the early 1970's. Two to three hundred drums of unknown waste materials are reported to be in the foundation of the building. No

records were found describing what was in the drums. The disposal unit was never permitted by ADPC&E or its successor ADEQ.

Former wastewater treatment ponds (Site 2 in FI, SWMUs 69, 70, and 71 RFA) were used for elementary neutralization and waste disposal from 1972 through 1977. These ponds functioned primarily as an infiltration system, and were not permitted for discharge to surface water. A number of uncontrolled releases were reported during the early 1970's.

Drum disposal areas were unearthed during pre-construction activities in the early 1990s of Unit 6 (DCA plant). Further characterization (*Site Characterization and Drum Disposal Area Delineation Work Plan*, May 1990) and removal activities were done under a CAO issued by ADPC&E. The *Site Characterization Report*, June 1990, provided general site characterization of construction areas for the DCA plant and associated tank farm, the Administration Building, and delineation of a drum disposal area. Further characterization of other potential drum disposal areas within the construction areas were reported in *Geophysical Survey and Soil Sampling Program*, March 1992. Two additional drum disposal areas were identified. All three of the drum disposal pits were reported constructed in December 1972 by plant personnel. Contents of the drums were determined to be primarily Dinoseb produced by a former operator Ansul Corporation. Drum burial activities were believed to be done by employees of either Eagle River Chemical Corporation or Helena Chemical Corporation. (Memorandum from Allen Malone to Environmental Safety Designs, 8-26-92)

Other disposal trenches were constructed for the disposal of Dinoseb wastes and products around 1972. Approximate location was disclosed through depositions from former employees and was presented in Appendix A of the *Facility Investigation Preliminary Report*, September 15, 1992. Subsequent facility investigations confirmed the presence and defined the approximate extent of the disposal areas. The results of the investigations of this disposal area are presented as Site 9 in the *Facility Investigation Report*, June 26, 1996.

3.2.2.4 Paved Areas

The central manufacturing areas are mostly paved. Paving was used to cover some soils that were visibly stained yellow with the product Dinoseb that was formerly manufactured in the early 1970s.

3.2.3 Location of Subsurface Features

One underground storage tank is located behind the R&D Laboratory containing unknown amounts of contaminants.

A former underground wastewater pipeline traverses the site from the vicinity of Unit 5 along the eastern side of the property. Although it was reported this line was replaced with above ground piping, this pipe was determined to be a significant source of 1,2-dichloroethane in historical operations. This subsurface feature may be a continuing source of groundwater contamination.

Site 5 Drum vault is located in the foundation of the maintenance warehouse and was reported to contain 200-300 drums of waste materials. Investigations showed the area to be highly contaminated. Site 5 sits on Site 9 and it is therefore unknown if the drum vault contributed to contamination or if the high levels of contaminants were solely those of Site 9. This subsurface feature may be a continuing source of groundwater contamination.

Site 9 Former Dinoseb Ponds were reported to be disposal sites for Dinoseb products and waste materials. Investigations showed the area to be highly contaminated. Site 5 sits on Site 9 and it is therefore unknown if the drum vault contributed to contamination. This subsurface feature may be a continuing source of groundwater contamination.

Site 2 Former Wastewater Treatment Ponds were reported to be historical disposal sites used by previous operators and other industry. Investigations showed the ponds to be highly contaminated. This subsurface feature may be a continuing source of groundwater contamination.

Other underground disposal areas have been reported in the Site 4 area. During the installation of monitoring wells 4MW-1 (near the Unit 1 expansion area) and 4MW-2 (between the Unit 3 expansion area and Unit 4) unusual conditions were encountered. At well 4MW-1 a pocket of gas was encountered in the semi-confined portion of the alluvial aquifer. An explosimeter on the drill rig sounded an alarm indicating the presence of explosive gas. PID reading at the augers indicated a concentration of 144 ppm organic vapors. The gas was sampled with Draager tubes and it was concluded that concentrations were too high to be accurately quantified by that method. Well 4MW-2 was installed approximately 160 feet southwest of well 4MW-1 and no gas was encountered, but soil cores retrieved from the alluvial sands was saturated yellow to orange foamy water (*Facility Investigation*, EnSafe, June 1998).

3.2.3.1 Underground Storage Tanks

There is one known underground storage tank containing waste materials at the plant. The tank apparently accumulated wastewater from one or both the laboratories and sewer. The tank is located behind the R &D laboratory on the west side of the building. It appears the tank may be connected or capable of being connected with underground piping and associated pumping equipment. Accumulated wastewater was pumped to the wastewater treatment plant, based upon interviews with former plant personnel. It is unknown if this tank was associated with a leach field. This tank is listed as SWMU 10 Laboratory Sump in the RFA.

3.2.3.2 Piping

Most of the underground piping associated with wastewater management was replaced with above ground piping during the 1990's. Underground piping remains behind the main warehouse (southeast corner of the manufacturing area) where wastewater and stormwater piping cross Industrial Park Drive to the WWTP. A 4.5 mile underground pipeline to the Mississippi river from the wastewater treatment plant is used for the NPDES discharge.

3.2.4 Operational Status

The plant was placed in mothball status during the final days of bankruptcy prior to abandonment. The operational status is largely unknown based upon available documentation.

All areas of the plant may be considered operational based upon the presence of process equipment. Not all areas of the plant have utilities turned on.

3.2.5 Security

ADEQ currently has a contractor that provides 24 hours per day, 7 days per week site security. The manufacturing area and wastewater treatment areas are fenced with locked gates to prevent unauthorized entry.

No trespass and signs warning of unauthorized entry are posted on the main entrances to the plant and perimeter fencing.

3.2.6 Surrounding Land Use

The plant is bordered by farms, State Highway 242, the Union-Pacific Railway, and other industrial park properties. Residential areas are located within one-half mile to the southwest and northeast of the CCC site (Environmental and Safety Designs, 1996).

4.0 Site History

Prior to 1970, the land was used for agriculture. In 1970, Helena Chemical Company acquired the site for construction of a Propanil and Methoxychlor manufacturing facility. In 1971, the plant was sold to Jerry Williams, who transferred the plant to Eagle River Chemical Corporation, which was initially controlled by Ansul Company. Under Ansul's management, the plant was converted for production of dinitorobutylphenol (Dinoseb). In 1973, Jerry Williams purchased the Eagle River Chemical Corporation, and retained the name Eagle River Chemical. Subsequently, the Eagle River Chemical Corporation merged into the Vertac Chemical Corporation. In 1986, the plant was sold to Cedar Chemical Corporation, which currently owns the facility (Environmental and Safety Designs, 1996).

4.1 Operational History

The plant originally opened for the production of various herbicides, pesticides, organic chemicals, and inorganic chemicals. The plant was a custom chemical manufacturer throughout its operational history.

4.1.1 Manufacturing

Production Units 1 and 4 manufactured various custom products, Production Unit 2 produced Propanil, Production Unit 5 manufactured nitroparaffin derivatives, and Production Unit 6 produced dichloroaniline. Production Unit 3 manufactured herbicides (RP-10), benzene

sulfonyl chloride, alkylated phenol, and methylthiopinacolone oxide (MTPO) until it was destroyed in an explosion and fire on September 26, 1989.

At the time of bankruptcy, the Air Permit listed the following processes:

Unit 1 could produce and/or process the following products or product intermediates: BFG Resin, Pentabrom, Metolachlor, Cyclanilide (re-wash from Unit 5), Methanol Recovery, 2-Amino-1-Butanol (2-AB) (distillation from Unit 5), Ro-Neet.

Unit 2 produced Propanil exclusively.

Unit 3 produced Diuron and MACE CS.

Unit 4 produced Aciflourfen exclusively.

Unit 5 could produce the following products or product intermediates: Tramethamine, Ticona, Cyclanilide, 2-Amino-1-Butanol (2-AB).

Unit 6 produced 3,4-Dichloroaniline (DCA) exclusively.

4.1.2 Hazardous Substances

USEPA Region 6 initiated an emergency removal of hazardous materials contained in piping, tanks and containers during the summer of 2003. Hazardous substances included: acetic acid, benzoic acid, carbon tetrachloride, butylamine, 4-chloroaniline, 2-chloroethyl ether, copper, copper cyanide, cumene, 2,6-dichlorobenzonitrile, 1,2-dichloroethane, dichlorotoluene, Dimethyl sulfate, 2,4-dinitrotoluene, diphenylamine, ethylamine, ethylene oxide, formic acid, formaldehyde, hexachlorobenzene, hydrofluoric acid, nitrobenzene, p-nitrobenzene, pentachloronitrobenzene, potassium cyanide, pyridine, quinoline, sodium cyanide, sodium fluoride, sodium nitrite, 1,2,4-trichlorobenzene, triethylamine, zinc. All of these chemicals are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and 40 CFR § 302.4. (EPA Action Memo 2003)

4.2 Ownership History

The facility was originally constructed in 1970 by Helena Chemical Company. In 1971, the company was sold to J.A. Williams, which transferred the plant to Eagle River Corporation, a company controlled by Ansul Company. In 1972, Ansul sold its interest in Eagle River Corporation back to J.A. Williams and the company was merged into Vertac Chemical Company. Vertac Chemical Company owned the facility until 1986. Cedar Chemical Corporation acquired the facility in 1986. Trans Resources, Inc. purchased Cedar Chemical Corporation in 1988. Nine West, a holding company owned by Trans Resources, owned Cedar at the time of bankruptcy.

4.3 Past Regulatory Involvement

The plant was constructed and began operations before the passage of the Clean Air Act, the Clean Water Act, CERCLA, and RCRA. Operations began before permitting under Federal authorities. The Arkansas Department of Pollution Control and Ecology (ADPC&E) became initially involved by citizen complaints related to uncontrolled discharges of water and odors shortly after production began in the early 1970s. ADPC&E was a newly formed agency established through the Arkansas Air and Water Pollution Control Act.

4.3.1Permits

ADEQ Minor Source Air Permit #: 878-AR-13
ADEQ NPDES Permit # AR0036412

4.3.1.1 Air

Permit 126-A was issued to Eagle River Chemical Corporation on 7/28/72 for the manufacture of 3,4-Dichloropropionanilide (Propanil).

Permit 126-AR-1 was issued to the Eagle River Chemical Corporation on 11/19/76 to include manufacture of Nitro Benzoate Ester, Methomyl, and Basalin.

Permit 126-AR-2 was issued to the Eagle River Chemical Corporation on 9/29/78 to replace a steam jet vacuum device with a vacuum pump.

Permit 126-AR-3 was issued to Vertac, Incorporated on 11/16/79 to include manufacture of Permethrin and Cypermethrin.

Permit 126-AR-4 was issued to the Vertac Chemical Corporation on 11/16/79 to include expansion of the DRA production unit.

Permit 878-A was assigned to the Cedar Chemical Corporation on 4/4/88 to update the existing air permits.

Permit 878-AR-2 was issued to Cedar Chemical Corporation on 12/12/89 to include production of Tris (hydroxymethyl) aminomethane (TA), 2-amino-butanol (2AB), and 2-amino-2-propanol (AMP) in unit 5.

Permit 878-AR-3 was issued to Cedar Chemical Corporation on 7/10/90 to include manufacture of Telene polymer resin in Unit 1 and 3,4-Dichloroamine (DCA) in Unit 6.

Permit 878-AR-4 was issued to Cedar Chemical Corporation on 9/17/91 to include manufacture of Di 2-Ethylhexylphosphorice Acid (DEPHA) in Unit 4.

Permit 878-AR-5 was issued to Cedar Chemical Corporation on 11/12/91 for the production of Sectagon and Cobra in Unit.

Permit 1351-A was issued to Cedar Chemical Corporation on 12/15/92 for the production of ADPA, a cleaning agent, in Unit 4.

Permit 878-AR-6 consolidated permits 878-AR-5 and 1351-A , removed production of Methyl Ethyl Sulfide (MES) and production of Methyl 2-Benzimidazole Carbamate (MBC), and authorized production of TCDNB, Diuron, and the bleach process. This modification also assigned individual emission rates to existing boilers and oil heaters.

Permit 878-AR-7 was a minor modification allowing for the production of Graphsize A in Unit 4.

Permit 878-AR-8 was a minor modification allowing for the production of Suresize 25 and Suresize 30 in Unit 1.

Permit 878-AR-9 was a minor modification allowing for the production of Tritolyl phosphite (TTP) in Unit 4 and production of Diuron in Unit 2 (Diuron is normally produced in Unit 5).

Permit 878-AR-10 was issued to Cedar Chemical Corporation on 2/3/98 to add Unit 3 for production of Diuron, add a new boiler, update all tank information, and update many equipment changes authorized through letters from the Department.

Permit 878-AR-11 was issued to Cedar Chemical Corporation on 8/23/01 to incorporate several De Minimis applications submitted by the facility that included the addition of Stanol in Unit 5, the addition of Pentabrom in Unit 1, the installation of a new product dryer to remove 1,4 Dichlorobenzene from Ticona in Unit 1, the addition of the MACE CS recovery in Unit 3, the addition of Metolachlor in Unit 1, the addition of Cyclanilide in Unit 5 and its washing in Unit 1, the installation of a methanol recovery process into Unit 1, and the addition of 2-Amino-1-Butanol (2-AB) in Unit 5.

Permit 878-AR-12 was issued to Cedar Chemical Corporation on 1/25/02 to allow for distillation of 2-Amino-1-Butanol (2-AB) in Unit 1. Emissions were routed through the Unit 1 Scrubber (SN-01d) with water being the scrubber liquid. In addition, this modification allowed increases in the monthly raw material throughput and production levels for the Diuron process in Unit 3. There will be no change in the hourly or annual emissions to the Unit 3 process.

4.3.1.2 Water

The facility currently holds NPDES permit No. AR0036412. The permittee submitted a permit renewal application on April 25, 2001. The current NPDES permit was reissued for a 5-year term in accordance with regulations promulgated at 40 CFR Part 122.46(a). The facility is authorized to discharge from a facility located at Highway 242 South in Section 14, Township 2 South, Range 4 East in Phillips County, Arkansas, Latitude: 34° 31' 13"; Longitude: 90° 39' 10", to receiving waters named Mississippi River in Segment 6B of the Mississippi River Basin. The outfall is located at the following coordinates: Outfall 002:

Latitude: 34° 29' 55"; Longitude: 90° 35' 29". This permit became effective on June 1, 2002, and the authorization to discharge expires at midnight, May 31, 2007.

4.3.1.3 Hazardous Waste

In November 1980, Vertac Chemical Corporation filed a Resource Conservation and Recover Act (RCRA) Part A permit application with the Arkansas Department of Pollution Control and Ecology (ADPC&E). Subsequently, interim status was granted for a hazardous waste storage tank, a hazardous waste container storage area, and a biological treatment lagoon. Vertac submitted a RCRA Part B application on August 15, 1984. In November 1984, Vertac Chemical Corporation requested that the biological treatment lagoon be removed from the list of interim status facilities requiring a RCRA permit because the system was not used to treat hazardous waste. ADPC&E approved this request on November 16, 1984 (ADPC&E, 1984). CCC submitted a revised RCRA Part A permit on March 1, 1986. The two storage units were RCRA closed in 1988, with no post-closure care required. Thus, the Part B application was not processed and a RCRA permit was not issued.

4.3.1.4 Consent Administrative Orders

On May 30, 1986, ADPC&E conducted a compliance evaluation inspection (CEI) and observed violations. As a result, ADPC&E issued a notice of violation on December 19, 1986, indicating that CCC was disposing of hazardous waste to the biological treatment ponds and that a sump pump within the container storage area was broken at the time of the CEI. Subsequently, Consent Administrative Order (CAO) No. LIS 86-027 was issued on July 16, 1987, to CCC, which essentially required them to stop disposing of hazardous waste to surface impoundments and investigate potential release(s) to surrounding media.

On June 26, 1990, CCC was informed of a violation that was observed during another CEI. The violation involved the disposal of contaminated monitoring well purge water directly onto surface soil.

ADPC&E issued CAO No. LIS 91-118, requiring CCC to conduct a facility investigation (FI). Field activities for Phase I of the FI began on August 30, 1993. Two additional phases (Phase II and III) of the FI were conducted in 1994 and 1995, respectively. In 1996, a FI report was submitted that summarized all three phases of the FI and recommended that additional sampling be conducted as part of a corrective measures study (CMS).

On May 5, 1993, ADPC&E conducted a CEI and violations were observed. The CEI report indicated that CCC failed to determine if a solid waste was hazardous waste in accordance with APC&EC Regulation 23 Section 262.11 and failed to comply with the requirement of personnel training in accordance with APC&EC Regulation 23 Section 262.34(a)(4).

On May 27, 1998, Arkansas Department of Environmental Quality (ADEQ), the successor agency to ADPCE, conducted a CEI and observed violations. The CEI report indicated that CCC had been accumulating hazardous waste for more than 90 days in an

unpermitted unit. Subsequently, ADEQ issued CAO No. LIS 99-131, which required CCC to achieve and maintain compliance with Arkansas state regulations.

On June 4, 2002, ADEQ conducted a CEI and noted that CCC was accumulating hazardous waste for more than 90 days in an unpermitted unit and relinquished hazardous waste to an unpermitted transporter. In an August 14, 2002 letter, ADEQ required that CCC submit manifests to ADEQ for the waste being shipped off-site by a permitted transporter and to a permitted treatment, storage, and disposal facility (TSDF).

4.3.1.5 Investigation Reports

Dioxin Sampling, Vertac Chemical, West Helena, Ecology and Environment Memorandum from Tom Smith, February 1985

Sampling Mission Results from the Vertac-West Helena Site, EPA/Ecology and Environment Inc., July 1986

Surface Impoundment Sampling and Analysis Report, Sorrells Research Associates Inc., March 1988

RCRA Facility Assessment PR/VSIReport, EPA, 1988

Hydrogeologic Study, Grubbs Garner and Hoskyn Inc., July 1988

Final Report of Installation and Analysis of a Groundwater Monitoring Well System CAO LIS 86-027, Letter from Joe Porter, June 1990

Final Groundwater Report CAO LIS 86-027 Engineering Evaluation, Letter from Joe Porter, August 1990

Site Characterization Report DCA Process Area, New Administration Building, Original Tank Farm Area, Tank Farm Area, Woodward-Clyde Consultants, June 1990

Geophysical Survey and Soil Sampling Program, Groundwater Services Inc., March 1992

Technical Memorandum, EnSafe, December 1993

Facility Investigation, EnSafe, March 1995

Facility Investigation Report, EnSafe, June 1996

Quarterly Groundwater Monitoring Report, EnSafe, June 1996

Second Quarterly Groundwater Monitoring Event, EnSafe, February 1997

Risk Assessment, EnSafe, October 1999

Groundwater Monitoring Report, September 2001

Risk Assessment Addendum, EnSafe, January 2002

4.3.1.6 Certifications, Registrations, and Licensing

There are no product registration labels currently owned by the pre-bankruptcy estate. Product registration labels historically were jointly owned by Riceco LLC and CCC. CCC owned less than 50 % interest in Riceco. CCC's shares of the registration labels were sold along with its interest in Riceco following bankruptcy.

Wastewater operator license is required by the NPDES permit for employees that that manage the wastewater treatment plant. The operator of this wastewater treatment facility is

required to be licensed by the State of Arkansas in accordance with Act 1103 of 1991, Act 556 of 1993, Act 211 of 1971, and Regulation No. 3, as amended.

5.0 Environmental Setting

Arkansas has a humid mesothermal climate that is typical of the southeast and south-central United States. The mean annual precipitation is 50 inches, and typical the maximum precipitation events occur between February and April. The mean annual temperature is 62.7 °F. The prevailing wind direction is to the southwest at an average speed of eight miles per hour (mph) and travels in that direction 12.3 percent of the time (Environmental and Safety Designs, 1996).

CCC is located approximately two miles west of the Mississippi River within the Mississippi Embayment Region of the Gulf Coastal Plain. The topography of the land is relatively flat with gentle slopes oriented to the southeast. Ground surface elevations at the site vary from approximately 188 feet above mean sea level (msl) in the southwest to 200 feet above msl in the northeast (Environmental and Safety Designs, 1996).

Phillips County is an attainment area for all primary and secondary air pollutants.

5.1 Hydrogeology

The alluvial aquifer is a major source of groundwater for agricultural use in eastern Arkansas. The alluvial deposits provide groundwater for irrigation wells in the areas surrounding Helena and West Helena, Arkansas. The irrigation wells are reportedly capable of producing approximately 1,000 gallons per minute (gpm). Domestic and municipal water supplies are typically obtained from the Sparta Sand/Memphis Sand aquifer system, which underlies the Jackson-Claiborne Group. Regional groundwater flow in the Sparta Sand is generally to the southeast toward the Mississippi River (Environmental and Safety Designs, 1996).

5.1.1 Regional

The surficial and near surficial soil consists of alluvial deposits of fine grained sands and silt from the Quaternary Age. The Quaternary alluvium in eastern Arkansas is generally comprised of an upper layer of silt and clay and a bottom layer of sand and gravel. The alluvial deposits are approximately 150 feet thick. The alluvium is typically the surface stratum in this region, except where Tertiary formations, such as Crowley's Ridge, outcrop. The bottom of Quaternary deposits sits on the erosional surface of older Cretaceous and Tertiary formations (Environmental and Safety Designs, 1996).

Underlying the alluvial deposits are the undifferentiated Jackson and Claiborne Groups of the Tertiary Age. The Jackson Group serves as a confining bed, as it is chiefly composed of clay with fine sand lenses; no water is typically produced from this stratum. The Claiborne Group is predominantly silty clay with thin, discontinuous beds of silty clay and lignite. The Jackson Group is generally made up of gray, brown, and green silty clay with peat

and lignite. In the vicinity of the site, the Jackson Clay is approximately 250 feet thick (Environmental and Safety Designs, 1996).

The lowermost geologic unit of concern at the site is the Sparta Sand. The Sparta Sand is comprised of primarily gray, very fine to medium sand with brown and gray sandy clay. This formation is likely to have been a beach deposit of a transgressing sea and ranges in thickness from 300 to 400 feet. The Sparta Sand serves as the major deep source of potable groundwater in the Helena/West Helena area (Environmental and Safety Designs, 1996).

5.1.2 Local

The general stratigraphic succession beneath the site from surface to depth includes surface soil and loess within fluvial alluvium, fluvial alluvium aquifer deposits (coarsening downward), Jackson Clay Group, and Sparta Sand. The primary focus of the 1993 FI field activities was the sampling of the alluvial deposits. Based on the sampling of the alluvium, five separate stratigraphic units were identified within the alluvial section beneath the site. Field activities involved only minimal sampling of the Jackson Clay, with no sampling of the Sparta Sand (Environmental and Safety Designs, 1996).

5.1.2.1 Lithology

During FI field activities, five distinct units were observed at the site. A fining upward sand and gravel sequence from the surface of the Jackson Clay was present at approximately 135 to 150 feet below ground surface (bgs). Overlying this unit is a fining upward sand sequence, ranging from poorly sorted coarse sand, at 135 feet bgs, to very fine silty sand at the top of the sequence, at approximately 40 feet bgs. Lignite and organic matter are associated with this alluvial unit. From the top of the alluvial sands to the ground surface, an interbedded, very stiff to firm, tan, gray, and brown silty clay and clayey silts were encountered. The silty clays and clayey silts were addressed as two distinct units during the FI field activities. The lower of the two units overlies the alluvial sands and gravels. This unit consists of a tight, gray to olive-gray clay with silt ranging from approximately 15 to 20 feet thick. This clay unit acts as a semiconfining unit at the site due to its low permeability rate; the contact between this semi-confining unit and the alluvial sands serves as a distinct layer. The second of the two units is surficial sediment comprised of a light brown to brown silt and silty clay layer extending from the surface of the gray clay to the ground surface. The contact between the semiconfining unit and the surficial sediments is another distinct layer observed within the alluvial deposits. (Environmental and Safety Designs, 1996).

Unit 1 from ground surface to 32 feet below ground surface (bgs) consists of silts, clays and sands. Unit 1 corresponds to surficial sediments.

Unit 2 from 32 to 47 feet bgs consists of clays and silts. Unit 2 corresponds to the semi-confining unit.

Unit 3 from 47 to 116 bgs consists of a coarsening downward sand sequence with clay stringers. Unit 3 corresponds to the upper 70 feet of the alluvial aquifer.

Unit 4 from 116 to 131 feet bgs consists of clay. Unit 4 is the middle section of the alluvial aquifer. This unit was not observed through borehole logging but was indicated by geophysical logging.

Unit 5 from 131 to 152.3 feet bgs consists of sand. Unit 5 is the lower section of the alluvial aquifer that overlies the regional confining layer (Jackson clay). This unit was not observed through borehole logging but was indicated by geophysical logging.

5.1.2.2 Depth to Groundwater

The site is underlain by several units of unconsolidated Quaternary and Tertiary age sedimentary deposits. Two aquifer regimes exist at the site, including a minor discontinuous perched zone in the silt and clay surficial sediments and the primary alluvial aquifer in the sand and gravel zones. The discontinuous perched zone was identified at Sites 1 and 2 in disturbed soil or fill overlying a surficial clay unit; water was encountered between 10 and 20 feet bgs. Perched groundwater was not encountered on top of the clay in the northern portion of the site. The clay unit is approximately 10 to 20 feet thick (Environmental and Safety Designs, 1995).

The alluvial aquifer ranges from 30 to 40 feet bgs to approximately 150 feet bgs, where it contacts the Jackson-Claiborne Group stratum of clay and lignite materials. The alluvial aquifer is comprised of silty sand, sand, and fine to coarse-grained gravel. Locally, the aquifer appears to be confined by the upper 40 feet of silt and clays, and acts as a confined or semi-confined aquifer. The Jackson Clay is the basal confining unit for the alluvial aquifer in this region of Arkansas (Environmental and Safety Designs, 1995).

Data obtained during the Phase II Investigation reflect a 4-foot rise in head between November 1994 and January 1995, groundwater elevations from the April 1996 event are 1 to 2 feet lower than those measured during January 1995. These data indicate that the unit is dynamic and responsive to seasonal fluctuations in rainfall (*Facility Investigation*, EnSafe, June 1996).

5.1.2.3 Uppermost Aquifer

The uppermost aquifer (Alluvial aquifer) is contained within Quaternary aged deposits of gravel, sands, and silts within the alluvial floodplain of the Mississippi alluvial plain. The Alluvial aquifer is characterized by a fining upward sequence of gravel, sands and silts attaining a maximum thickness of 200 feet in the region. These deposits are approximately 150 feet thick beneath the site. Portions of the upper soils apparently consist of outwash from Crowley's Ridge as evidenced by the relatively high silt content. The alluvial aquifer is a major source of groundwater throughout the Mississippi Embayment. The Alluvial aquifer has a long history of use for drinking water and irrigation.

The perched groundwater, although discontinuous, appears to be hydraulically connected to the alluvial aquifer.

5.1.2.4.Confining Layers

Underlying the alluvial deposits are the undifferentiated Jackson and Claiborne Groups of the Tertiary Age. The Jackson Group serves as a confining bed, as it is chiefly composed of clay with fine sand lenses; no water is typically produced from this stratum in the general area of the site. The Claiborne Group is predominantly silty clay with thin, discontinuous beds of silty clay and lignite. The Jackson Group is generally made up of gray, brown, and green silty clay with peat and lignite. In the general vicinity of the site, the Jackson Clay is approximately 250 feet thick (Environmental and Safety Designs, 1996).

5.1.2.5 Groundwater Flow Direction and Gradient

Groundwater in the alluvial aquifer flows predominantly south to southwest, at an average flow gradient of 0.0006 feet/foot. The transmissivity of the aquifer is 30,000 ft^2 /day and the hydraulic conductivity is 273 ft/day. These were established from slug tests performed in the investigations. Effective porosity of the aquifer was estimated to be 20%. The groundwater flow velocity was calculated to be 0.82 ft/day or 299 feet per year in the lower alluvial aquifer.

Groundwater in the perched interval at Site 1 flows to the southwest at a gradient of 0.01 feet/foot. Groundwater elevations varied significantly (more than 5 feet) between monitoring events, and do not trend consistently up or down, suggesting that water levels are highly dependent on seasonal rainfall (*Facility Investigation*, EnSafe, June 1996).

5.1.2.6 Groundwater Quality

The alluvial aquifer is recognized as a Class 1 aquifer and therefore recognized as having good water quality that is suitable for most purposes.

Water pumped from the alluvial aquifer is typically a calcium bicarbonate type, which contains appreciable amounts of magnesium and iron. Other dissolved constituents in the water, but in comparatively small concentrations, include sodium, chloride, potassium, sulfate, silica, nitrate, fluoride, and manganese. Hardness and dissolved iron in the water of the alluvial aquifer generally limit its use for municipal, industrial, and domestic supplies unless it is treated (*Water Resources Circular No. 13*, USGS/AGC, 1982).

5.2 Soils

The upper six feet of soils at the site were described and classified as the Convent Series. This soil series is comprised of somewhat poorly drained, level soil that develops on alluvial fans at the foot of Crowley Ridge, which is a major regional structural feature. The soil of the Convent Series is characterized by medium-to-low organic matter content, moderate permeability, and high available water capacity. The Convent Series is predominantly made up of friable silt loam with granular structure, roots, and organic matter present at the uppermost horizon. Underlying this layer exists a series of horizons comprised of silt loam parent material

with platy structure and mottling that increases in abundance and distinction with depth (Environmental and Safety Designs, 1996).

5.3 Surface Water

Surface water bodies on the CCC site or in the vicinity of the CCC site include a wetland, industrial park ditch (a tributary of Chaney Creek), Chaney Creek (a tributary of Beaver Bayou), Beaver Bayou (a tributary of Big Creek), Big Creek (a tributary of the White River), the White River and the Mississippi River.

All surface water runoff from the facility is directed to the stormwater drainage system (SWMU 59). This system drains into the storm water sump (SWMU 60). When the capacity of the sump is exceeded, the system drains to National Pollutant Discharge Elimination System (NPDES)-permitted Outfall #001. This outfall drains to the industrial park ditch adjacent to the facility. The industrial park ditch drains to Chaney Creek, then to Beaver Bayou, then to Big Creek and eventually to the White River. Effluent from the wastewater treatment system is pumped off site through a 4.5-mile pipeline to NPDES-permitted Outfall #002, where it is discharged directly into the Mississippi River. NPDES Permit AR0036412 was issued to CCC in September 1985 and renewed in September 1990.

5.3.1 Runoff Pathways

Surface runoff generally flows toward the southwest to tributaries of the White River and eventually into the Mississippi River. Localized changes in topographic relief are attributable primarily to anthropogenic alterations made for construction, or for directing surface water runoff. Because the topography of the region is relatively flat, overland flow velocities are low and some areas where the original ground surface has not been modified are poorly drained

5.3.1.1 Natural

The natural drainage pathway from the site is to industrial park ditch (a tributary of Chaney Creek), Chaney Creek (a tributary of Beaver Bayou), Beaver Bayou (a tributary of Big Creek), Big Creek (a tributary of the White River), the White River and eventually to the Mississippi River.

5.3.1.2 Man Made

To improve drainage, unlined storm water drainage ditches have been constructed to divert runoff water to retention and treatment basins. Stormwater historically was discharged into an un-named industrial park ditch adjacent to the wastewater treatment facility through the NPDES permitted outfall #001. Discharge to outfall 001 was eventually terminated due to non-compliance associated with chronic toxicity. Cedar conducted a Toxicity Reduction Evaluation during the mid 1990's and re-routed all stormwater to the wastewater treatment facility.

The central drainage ditch and central manufacturing area has been observed to flood during periods of heavy precipitation. Although flooding has been observed, there are no indications of manufacturing interruptions reported by plant personnel. Plant maintenance personnel historically responded as needed to storm events to prevent interruptions to manufacturing, damage to equipment, and uncontrolled discharges.

5.3.2 Distance to Receiving Surface Waters

The wetland is adjacent to the wastewater treatment system. Beaver Bayou is located near the industrial park ditches. The Mississippi River is located approximately four miles east and Big Creek is located approximately 15 miles southeast of the CCC facility.

5.3.2.1 Potential Receptors

Arsenic, Aldrin, Dieldrin, 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT), Endrin, gamma-BHC, Methoxychlor, and Toxaphene were detected in sediment at Area I above the EPA Region 4 sediment screening values. Two potential receptors (tadpoles and piscivorus birds) were identified in the *Risk Assessment*. Tadpoles in the ditches may potentially be exposed to contaminated sediment identified in the ditches. Because of the nature of contamination in sediment, bioaccumulation is possible. In addition, piscivorus birds may also ingest tadpoles with elevated levels of pesticides. However, the *Risk Assessment* indicates the potential risk in Area I was considered acceptable because the ditches are used as an integral component of the facility's wastewater treatment system. Due to the function of these ditches, standing water is frequently drained and, thus, any emerging aquatic habitat was considered opportunistic (Ensafe, 1999).

No potentially complete ecological exposure pathways for Area II were identified in the *Risk Assessment* (Ensafe, 1999).

In Area III, an ecological potential pathway identified in the *Risk Assessment* included receptors exposed to contaminated groundwater during irrigation activities. However, ecological risks were not evaluated since no data was available from the irrigation wells at the time the *Risk Assessment* was conducted. The risk assessment indicated that only small mammals and birds species are present in Area III. The risk assessment indicated that during hot summer months when irrigation is frequent, wildlife species are likely dormant during the heat of the day and seek refuge in wooded areas. Thus, exposure to contaminated groundwater during irrigation events was not anticipated to be significant for potential ecological receptors (Ensafe, 1999).

Surface runoff from the site is controlled. Potential human receptors are discussed separately in Section 7 Human Health Risk Assessment. Potential human receptors include exposures to irrigation water offsite and stormwater onsite.

5.3.3 Flood Plains

CCC is not in the 100-year floodplain of the Mississippi River (Environmental and Safety Designs, 1996).

5.4 Ecology

Three ecological areas of concern were identified in the 1999 Risk Assessment. Area I consists of three ditches on site that make up the storm water retention system. Area II consists of an approximately two-acre isolated wetland located on the southwest boundary of the plant property. Area III includes all adjacent off-site non-industrial areas (Ensafe, 1999).

It should be noted that although three ecological areas of concern were identified in the 1999 Risk Assessment, only one area (Area I) was evaluated in the risk assessment because no relevant data (surface soil, sediment, or surface water) were collected at Areas II and III (Ensafe, 1999).

5.4.1 Plant Populations

The dominant wetland vegetation identified during the June 4, 1999 ecological survey in area II consists of Black Willow (Salix nigra), Chickasaw Plum (Prunus anjustifolia), common Cattails (Typha latifolia), Floating Primrose Willow (Ludwgia spp.) and duckweed (Lemna spp.) (Ensafe, 1999).

5.4.2 Animal Populations

During the June 4, 1999 ecological survey, two species of tadpoles (Bullfrog [*Rana catesbeiana*] and Southern Leopard [*Rana utricularia*]) were observed in the ditches. Two species of birds were also feeding in and around the ditches. The Killdeer (*Charadrius vociferus*), which is a farm country plover, usually inhabits fields, airport, lawns, riverbanks, and shores. In addition, the Green Heron (*Butorides striatus*), which feeds on a variety of fish, frogs, crawfish, insects, and other aquatic life, was identified (Ensafe, 1999).

5.4.3 Potentially Affected Ecosystems

Area I consists of three on-site ditches that served as a storm water retention system, which is a component of the wastewater treatment system. These open ditches are vegetated with various grasses along the edges, and submergent plants are present in more frequently submerged portions.

Area II consists of a two-acre isolated wetland constructed in 1978 to serve as an overflow retention pond for the wastewater treatment system. Once the pond was excavated, it was determined that an overflow system was not necessary; therefore, a connection between the treatment system and ponds was never installed. Over the years, the excavated area developed wetland characteristics through natural secession and now meets the U.S. Army Corps of Engineers (USACE) definition of a wetland (Ensafe, 1999).

Area III includes all off-site non-industrial areas within one mile of the facility. These areas include agriculture farm lands, ditches, and tributaries to Big Creek. Approximately 99 percent of Area III is cultivated with cotton, soybeans, or winter wheat. The tributaries discharge to Big Creek approximately 15 miles southeast of the facility (Ensafe, 1999).

5.4.3.1 Endangered Species

According to the 1999 risk assessment, there are 16 State and Federal listed threatened and endangered species in Phillips County; however, none of these species has been identified at or in the general vicinity of the CCC site (Ensafe, 1999).

5.4.3.2 Sensitive Environments

No ecologically sensitive water bodies are indicated by APC&EC Regulation 2 within the potentially impacted surface drainage basin. The St. Francis River, located north of the facility) is identified as an ecologically sensitive water body, and Second Creek (located northeast of the facility) is identified as an extraordinary resource water body, neither of which are located within the same drainage basin as the facility.

5.4.3.3 Specially Designated Areas

The White River National Wildlife Refuge is located within the potentially impacted drainage basin. Surface water drainage from the immediate vicinity of the facility eventually drains into the White River.

5.4.3.4 Recreational Uses of Area

APC&EC Regulation 2 list all surface waters within the drainage pathway from the plant site as primary (watersheds >10 $mi.^2$) and secondary contact recreational areas. Streams are listed as Seasonal Delta Fisheries and/or Perennial Delta Fisheries (watersheds >10 $mi.^2$). No use variations were indicated as of 10-28-02 in *APC&EC Regulation 2*.

6.0 Environmental Site Assessment

Environmental site assessments were conducted in several phases during the site history. The investigations were conducted under CAO authority and associated workplans were approved by ADEQ (or its predecessor ADPC&E).

Associated workplans are listed below:

Hydrogeological Investigation Study, Grubbs Garner and Hoskyn, April 1988
Site Characterization and Drum Disposal Area Delineation Workplan, Woodward-Clyde Consultants, May 1990
Facility Investigation Workplan, EnSafe, January 1993
Phase II Facility Investigation Workplan, EnSafe, June 1994

Interim Response Workplan, Ensafe, April 1995
Risk Assessment Workplan, EnSafe, July 1996
Interim Measures Plan of Action, EnSafe, May 1998
Risk Assessment Workplan Revision 2, EnSafe, October 1998

Seventy-four SWMUs and two areas of concern (AOCs) were identified by EPA in the RFA. Subsequently, eighty SWMUs and three AOCs were identified at CCC in the 1992 FI Preliminary Report. However, subsequent investigations were conducted on a Site basis, incorporating multiple SWMUs and/or AOCs into a Site, rather than investigation by individual SWMU or AOC. According to the available file material, it appears that only 74 SWMUs and two AOCs were carried through to further site investigations. (*Draft Conceptual Site Model*, EPA, 2003)

Table 1[1, 2]
Site Descriptions

Site	Site Name	SWMUs/AOCs Included
1	Wastewater Treatment Ponds	Wastewater Tank 2 (SWMU 63), Flow Equalization Basin (SWMU 64), Aeration Basin (SWMU 65), and Polish Pond (SWMU 68)
2	Former Waste Treatment Ponds	Inactive Pond 1 (SWMU 69), Inactive Pond 2 (SWMU 70), and Inactive Pond 3 (SWMU 71)
3	Stormwater Ditches	Stormwater Drainage System (SWMU 59) and Stormwater Sump (SWMU 60)
4	Rail Spur Loading/Unloading Area	Railroad Spur Loading and Unloading Area (SWMU 74) and Railroad Loading and Unloading Sump (SWMU 3)
5	Drum Vault	Maintenance Services Drum Vault (SWMU 72)
6	Yellow Stained Areas	Yellow Stained Areas (AOC 1)
8	Ditch by Wastewater Treatment Area	Ditch by Wastewater Treatment Area (AOC 3)
9	Former Dinoseb Disposal Ponds	The site is comprised of three suspected abandoned ponds in the area between the dichloroaniline unit and the maintenance services building. These ponds were reportedly shallow, unlined basins used to dispose of off-specification Dinoseb. The ponds are no longer used and have been backfilled. Buildings have also been constructed in the vicinity of the ponds, and some areas have been paved or covered with gravel. Heavy yellow staining is present on the surface soil of unpaved areas.

[1] Environmental and Safety Designs, 1996
[2] Ensafe, 1999
(*Draft Conceptual Site Model*, EPA, 2003)

6.1 Background Conditions

Background soil conditions were evaluated by collecting soil samples from soybean fields adjacent to the facility. Samples were analyzed for VOCs, SVOCs, pesticides and RCRA metals. Three samples were initially collected. All three samples had detectable concentrations

of all the types of contaminants. Background sample locations may be impacted by facility operations from air releases as evidenced by the presence of VOCs.

Background conditions of the alluvial aquifer were intended to be evaluated during the investigation with existing monitoring well(s). At least one well (EMW-2) appeared to be located hydraulically upgradient. However, the well was also within close proximity to waste disposal activities that are known to have impacted groundwater quality. Background conditions of the alluvial aquifer may not be represented in any of the previous investigations. The alluvial aquifer is well known to be suitable for most uses including drinking water and irrigation.

6.2 Analytical Parameters

Sample analysis included the following classes of chemical compounds: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCB, metals, and water quality indicator parameters. Certain soil samples were evaluated for the purpose of evaluating the potential for contaminants to leach from the soil into groundwater. More than thirty contaminants from all chemical classes were determined to be present in soils and/or groundwater.

6.2.1 Laboratory Analytical Procedures

EPA methods of analysis were used throughout the investigations. ADEQ also requires the use of certified laboratories for all analyses. A summary of the analytical methods used in the investigations are listed below:

Volatile organic compounds - Methods 8240 and/or 8260
Semi-volatile organic compounds – Method 8270
Organochlorine pesticides – Method 8080/608
40 CFR Part 265 Appendix III Metals – Methods 200.7/6010/7000
Ammonia, bicarbonate, calcium, chloride, cyanide, fluoride, iron, magnesium, nitrate, sodium, sulfate, pH, specific conductance

6.2.2 Data Validation

Procedures for data validation were presented in the approved workplans. Additionally, ADEQ reviewed the data submitted and approved the investigation reports.

6.3 Monitoring Wells

Groundwater monitoring wells were installed at the CCC site during various phases of investigation. Six monitoring wells (1MW-1, 1MW-2, 1MW-3, 1MW-4, 1MW-5, and 2MW-2) were installed and screened in the perched groundwater zone. Fifteen upper alluvial groundwater monitoring wells have been installed on site. These include 1MW-6, 1MW-7, 2MW-3, 2MW-4, 2MW-5, 2MW-6, 4MW-1, 4MW-3, 9MW-1, EMW-1, EMW-2, EMW-3, EMW-7, and EPZ-5. Two additional upper alluvial groundwater monitoring wells (OFFMW-2 and OFFMW-4) were installed off site and downgradient of the CCC site. Two lower alluvial

groundwater monitoring wells (2MW-7 and 4MW-4) have been installed at the CCC site and two lower alluvial groundwater monitoring wells (OFFMW-1 and OFFMW-3) were installed off site and downgradient of the CCC site. The monitoring well locations are provided in Figures 1 and 2 of the Groundwater Monitoring Report dated September 21, 2001 (Ensafe, 2001). (*Draft Conceptual Site Model*, EPA, 2003)

6.3.1 Installation Procedures

Monitoring well designs and installation procedures are detailed in the *Facility Investigation Workplan*, January 1993. ADPC&E conditionally approved the workplan on June 1, 1993.

6.3.2 Sampling Procedures

Sampling procedures are detailed in the *Facility Investigation Workplan*, January 1993. ADPC&E conditionally approved the workplan on June 1, 1993.

6.4 Groundwater

To date, a groundwater monitoring program has not been established at the site. The most recent groundwater sampling event was conducted in July 2001. The groundwater data indicates that metals, pesticides, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) have been detected above either the Federal Maximum Contaminant Levels (MCLs) or the EPA Region 6 Medium Specific Screening Levels (MSSLs) for Tap Water. The primary contaminants of concern, both on and off site, are 1,2-dichloroethane and arsenic. The 1,2-dichloroethane contamination is present in both the perched and alluvial groundwater zones and the contamination has extended at least one mile off site and downgradient of the CCC site. In addition, it appears arsenic contamination has co-mingled with 1,2-dichloroethane contamination, which has resulted in arsenic being relatively mobile, and has migrated along with the dissolved 1,2-dichloroethane contaminant plume. (*Draft Conceptual Site Model*, EPA, 2003)

The maximum detected concentrations in the perched groundwater zone were as follows: 8.8 μg/l of arsenic, 0.087 μg/l of beta-BHC, 0.24 μg/l of Dieldrin, and 100 μg/l of 1,2-dichloroethane. The maximum detected concentrations in upper alluvial groundwater beneath the site are 603 μg/l of arsenic, 810 μg/l of benzene, 170 μg/l of chloroethane, 670 μg/l of 4-chloroaniline, 6,800 μg/l of 1,2-dichlorobenzene, 0.5 μg/l of 1,2-dichlorobenzene, 24,000 μg/l of 1,2-dichloroethane, 170 μg/l of Dinoseb, 2,000 μg/l of ethylbenzene, 480 μg/l of 4-methylphenol, 760,000 μg/l of toluene, 13,000 μg/l of xylenes, and 5 μg/l of vinyl chloride. The maximum detected concentrations detected in upper alluvial groundwater off site include 13.2 μg/l of arsenic and 14,000 μg/l of 1,2-dichloroethane. The maximum detected concentration of 1,2-dichloroethane in lower alluvial groundwater beneath the CCC site was 829 μg/l. The maximum detected concentrations of arsenic and 1,2-dichloroethane in the lower alluvial groundwater off site were 14.3 μg/l and 1,400 μg/l, respectively (Ensafe, 2001). (*Draft Conceptual Site Model*, EPA, 2003).

During the installation of monitoring wells 4MW-1 (near the Unit 1 expansion area) and 4MW-2 (between the Unit 3 expansion area and Unit 4) unusual conditions were encountered. At well 4MW-1 a pocket of gas was encountered in the semi-confined portion of the alluvial aquifer. An explosimeter on the drill rig sounded an alarm indicating the presence of explosive gas. PID reading at the augers indicated a concentration of 144 ppm organic vapors. The gas was sampled with Draager tubes and it was concluded that concentrations were too high to be accurately quantified by that method. Well 4MW-2 was installed approximately 160 feet southwest of well 4MW-1 and no gas was encountered, but soil cores retrieved from the alluvial sands were saturated yellow to orange foamy water.

6.4.1 Site 1 Wastewater Treatment Plant

Groundwater monitoring wells placed around the site indicate mounding caused by an infiltration source. Contaminants detected in perched groundwater suggest the mounding is caused by leakage from the wastewater treatment ponds or has migrated from some other source.

6.4.2 Site 2 Former Wastewater Ponds

Groundwater monitoring wells placed around Site 2 suggest that this area is prone to recharge from precipitation events. Contaminants present in the groundwater suggest that the contaminated soils likely contribute to groundwater contamination through partitioning from solid phase soil into aqueous phase infiltration (intermedia transfer).

6.4.3 Site 4 Railroad Loading Area

Unusual subsurface conditions were encountered at Site 4. During the installation of monitoring wells 4MW-1 (near the Unit 1 expansion area) and 4MW-2 (between the Unit 3 expansion area and Unit 4) unusual conditions were encountered. At well 4MW-1 a pocket of gas was encountered in the semi-confined portion of the alluvial aquifer. An explosimeter on the drill rig sounded an alarm indicating the presence of explosive gas. PID reading at the augers indicated a concentration of 144 ppm organic vapors. The gas was sampled with Draager tubes and it was concluded that concentrations were too high to be accurately quantified by that method. Well 4MW-2 was installed approximately 160 feet southwest of well 4MW-1 and no gas was encountered, but soil cores retrieved from the alluvial sands was saturated yellow to orange foamy water (*Facility Investigation*, EnSafe, June 1998).

6.5 Soils and Sediment

Soils and sediment are discussed together for consistency with data evaluations performed during the investigations. Sediment is discussed separately in the Ecological Risk Assessment section of this report.

6.5.1 Site 1 Wastewater Treatment Ponds

Surface soil, subsurface soil, and sediment samples were collected during Phase I FI activities. Metals, pesticides, SVOCs, and VOCs were detected in both soil and sediment. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil and sediment data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 44.6 mg/kg of arsenic, 0.593 mg/kg of Dieldrin, 9.6 mg/kg of Dinoseb, and 7.5 mg/kg of 1,2-dichloroethane. Maximum detected concentrations above industrial MSSLs in surface/subsurface soil included: 44.6 mg/kg of arsenic, 0.593 mg/kg of Dieldrin, and 7.5 mg/kg of 1,2-dichloroethane. Maximum detected concentrations in sediment above residential MSSLs included: 123 mg/kg of arsenic, 82 mg/kg of chromium, and 1,200 mg/kg of 3,4-dichloroaniline. It should be noted that the 3,4-dichloroaniline maximum detected concentration was detected above the 4-chloroaniline MSSL, which was used as a surrogate value because a MSSL for 3,4-dichloroaniline was unavailable. However, 3,4-dichloroaniline was inadvertedly excluded from the 1999 Risk Assessment, and thus, was not quantitatively or qualitatively evaluated. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.2 Site 2 Former Waste Treatment Ponds

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected and analyzed. Metals, pesticides, SVOCs, and VOCs were detected in soil. In the 1999 Risk Assessment (Ensafe, 1999), surface soil data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs included: 0.058 mg/kg of Aldrin and 100 mg/kg of Dinoseb. Maximum detected concentrations above industrial MSSLs in soil included: 68.8 mg/kg of arsenic, 161.8 mg/kg of cadmium, 111.7 mg/kg of mercury, 0.5 mg/kg of Aldrin, 0.350 mg/kg of Dieldrin, 170 mg/kg of 1,2-dichloroethane, 0.67 mg/kg of carbon tetrachloride, 13 mg/kg of chloroform, and 380 mg/kg of methylene chloride. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.3 Site 3 Storm water Ditches

During the 1993 field activities for Phase I of the FI, surface soil, subsurface soil, and sediment samples were collected and analyzed. Additional sampling was conducted in Phase II and Phase III of the FI activities. Metals, pesticides, SVOCs, and VOCs were detected in sediment, and Dinoseb was the only contaminant detected in soil. In the 1999 Risk Assessment (Ensafe, 1999), soil data were screened against industrial MSSLs, and sediment data were screened against residential MSSLs. Maximum detected concentrations above industrial MSSLs in soil included 13,000 mg/kg of Dinoseb. Maximum detected concentrations in sediment above residential MSSLs included: 222 mg/kg of arsenic, 0.354 mg/kg of Aldrin, 3.4 mg/kg of Dieldrin, 1.6 mg/kg of Toxaphene, and 5.3 mg/kg of pentachlorophenol. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.4 Site 4 Rail Spur Loading/Unloading Area

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected and analyzed. Pesticides and VOCs were detected in soil

consistently at elevated concentrations. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.455 mg/kg of Dieldrin and 840 mg/kg of Dinoseb. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 15.5 mg/kg of arsenic, 0.63 mg/kg of Dieldrin, 12,000 mg/kg of 3,4-dichloroaniline, 1,100 mg/kg of Dinoseb, and 0.82 mg/kg of 1,2-dichloroethane. (*Draft Conceptual Site Model*, EPA, 2003)

During the installation of monitoring wells 4MW-1 (near the Unit 1 expansion area) and 4MW-2 (between the Unit 3 expansion area and Unit 4) unusual conditions were encountered. At well 4MW-1 a pocket of gas was encountered in the semi-confined portion of the alluvial aquifer. An explosimeter on the drill rig sounded an alarm indicating the presence of explosive gas. PID reading at the augers indicated a concentration of 144 ppm organic vapors. The gas was sampled with Draager tubes and it was concluded that concentrations were too high to be accurately quantified by that method. Well 4MW-2 was installed approximately 160 feet southwest of well 4MW-1 and no gas was encountered, but soil cores retrieved from the alluvial sands was saturated yellow to orange foamy water.

6.5.5 Site 5 Maintenance Services Drum Vault

This site is comprised of SWMU 72, which is a concrete drum vault with a sub-floor of gravel, sand, and possibly cement located under the Maintenance Services Building. In 1993, subsurface soil samples were collected beneath the drum vault as part of the Phase I FI investigation and Dinoseb was detected beneath the vault, which CCC attributed to residual contamination from Site 9. No further action was recommended in the FI Report; however, ADPCE did not concur and required additional investigation. Subsequent to developing media-specific cleanup criteria, CCC intended to conduct additional sampling as part of a CMS. (*Draft Conceptual Site Model*, EPA, 2003)

In the 1999 Risk Assessment (Ensafe, 1999), available soil (including surface and subsurface soil) data were screened against industrial MSSLs. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 9.7 mg/kg of arsenic and 170 mg/kg of Dinoseb. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.6 Site 6 Yellow Stained Areas (Area of Concern 1)

Surface soil and subsurface soil samples were collected during Phase I FI activities. Metals, pesticides, SVOCs, and VOCs were detected in both soil and sediment. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.24 mg/kg of Aldrin, 0.078 mg/kg of Dieldrin, 340 mg/kg of Methoxychlor, 14 mg/kg of Toxaphene, and 160 mg/kg of Dinoseb. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.7 Site 8 Ditch by Wastewater Treatment Area (Area of Concern 3)

Surface soil samples were collected during Phase I FI activities. Metals and Dieldrin were detected in surface soil. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs. Maximum detected concentrations of 6.3 mg/kg of arsenic were above residential MSSLs. (*Draft Conceptual Site Model*, EPA, 2003)

6.5.8 Site 9 Former Dinoseb Disposal Ponds

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected. Metals, pesticides, SVOCs, and VOCs were detected in soil. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.15 mg/kg of Heptachlor, 450 mg/kg of 3,4-dichloroaniline, 29,000 mg/kg of Dinoseb, 4,000 mg/kg of Propanil, and 3.5 mg/kg of arsenic. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 7.3 mg/kg of arsenic, 29,000 mg/kg of Dinoseb, 450 mg/kg of 3,4-dichloroaniline, 4,000 mg/kg of Propanil, and 0.73 mg/kg of 1,2-dichloroethane. (*Draft Conceptual Site Model*, EPA, 2003)

Leaching tests performed on samples taken from Site 9 suggest a high potential for intermedia transfer.

6.5.9 Dichloroethane Source Area

Based on the concentration gradient of the plume determined after the completion of the Phase II investigation, it was concluded that the likely source area is near the production units on the northeast side of the plant. During interviews with employees, it was learned that there was formerly a tile wastewater discharge pipe that ran from Unit 5 to the wastewater treatment ponds, crossing the path of the suspected source area. The pipe was known to frequently leak. The area was investigated by sampling soils on 75 feet by 75 feet grid.

Analysis from the source area soil samples indicates two potential sources. The most heavily impacted area is southwest of Unit 4 and northeast of monitoring well EMW-7 (which is also the most heavily contaminated well with 1,2-dichloroethane at 84,000 ppb). The second, and less contaminated, source area appears to be around the southeastern side of Unit 5.

As the pipe was being decommissioned, an unknown quantity of a liquid chemical was observed in the pipe and trench (*Facility Investigation*, EnSafe, June 1998).

6.6 Surface Water

Surface water was managed under the facility's NPDES permit and was therefore not evaluated during the investigations or risk assessment done under ADEQ Hazardous Waste Division. The HWD collected surface water data since abandonment and this information is

presented in attachments. Low levels of volatile and semi-volatile organic compounds are typically present in stormwater samples. Since stormwater is controlled, complete exposure pathways are unlikely.

6.7 Air

Ambient air monitoring was conducted during Phase III of the investigation. Five stations at the site were monitored for six days. Each station was sampled with an FID for approximately two minutes. Concentrations ranged from non-detect to 2.1 ppm. Each of the five stations had at least one detection event. The FID device does not identify specific compounds and therefore the data is of no value for risk evaluation. The facility air permit allows discharge of compounds that are detectable by the FID.

Indoor air pathways from soils or groundwater were not evaluated in the Risk Assessment.

During the installation of monitoring wells 4MW-1 (near the Unit 1 expansion area) and 4MW-2 (between the Unit 3 expansion area and Unit 4) unusual conditions were encountered. At well 4MW-1 a pocket of gas was encountered in the semi-confined portion of the alluvial aquifer. An explosimeter on the drill rig sounded an alarm indicating the presence of explosive gas. PID reading at the augers indicated a concentration of 144 ppm organic vapors. The gas was sampled with Draager tubes and it was concluded that concentrations were too high to be accurately quantified by that method. Well 4MW-2 was installed approximately 160 feet southwest of well 4MW-1 and no gas was encountered, but soil cores retrieved from the alluvial sands was saturated yellow to orange foamy water.

6.8 Environmental Site Assessment Conclusions

ADEQ required Cedar to conduct an investigation of certain solid waste management units (SWMUs) due to the presence of visible contamination, non-compliance with applicable regulations for hazardous waste management, and related problems with stormwater runoff. Background conditions were also evaluated during the investigation.

Nine SWMUs and other areas of concern (AOCs) were included in the investigation. Extensive investigations of surficial and subsurface soils were done at the direction of ADEQ. Sample analysis included the following classes of chemical compounds: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), chlorinated pesticides, and metals. More than thirty contaminants from all chemical classes were determined to be present in soils. Waste materials were also determined to be present within certain SWMUs. All nine of the SWMUs and other areas of concern were determined to have contaminants present in concentrations greater than background and at concentrations that may continue to contribute to groundwater contamination. The investigation concluded significant impacts to surficial soils, surface water, and subsurface soils resulted from facility operations.

Surface soils were visibly stained yellow throughout most of the site history. The yellow color is associated with contamination from the herbicide Dinoseb. Subsurface soils at several of

the SWMUs contain contaminants in concentrations that may be considered hazardous waste. Soil cores and chemical analysis indicate that technical grade products were disposed in open pits. ADEQ did not issue any permits for land disposal of solid or hazardous wastes at the facility over the entire site history.

ADEQ required Cedar to conduct a groundwater quality assessment to evaluate the nature and extent of contaminants released from soils to the groundwater. Various pesticides, metals, semi-volatile organic compounds, and volatile organic compounds were determined to have been be released from contaminated soils into perched groundwater and the alluvial aquifer.

The groundwater quality assessment showed that the groundwater contaminant plume is not stable and continues to grow or lengthen down gradient of the site. Contaminant concentrations increased five orders of magnitude in off-site well OFFMW-2over the course of the groundwater investigation. This indicates that there are both continuing releases from contaminated soils into the groundwater and/or new releases from nonspecific sources causing further expansion of the plume. Approximately 200 drums of unknown waste materials are reported to be disposed in the foundation of a building representing a high risk for new or continuing releases into both soils and groundwater.

More than 20 contaminants have been detected in the groundwater. Groundwater in several locations may considered TC hazardous waste (D028) due to the presence of 1,2-dichloroethane (DCA) exceeding the 0.5 mg/L regulatory criteria. Contaminated media containing hazardous constituents in excess of toxicity characteristic (TC) may be considered a hazardous waste for treatment storage or disposal. EPA has determined that DCA is a probable human carcinogen. DCA has an MCL of 0.005 mg/L published for drinking water supplies. DCA has been detected in on-site groundwater at concentrations up to 84 mg/L.

Contaminated groundwater exceeding both the toxicity characteristic and MCL extends through a portion of the alluvial aquifer more than 4000 feet off-site. DCA was reported to be present at 14 mg/L in off-site well OFFMW-2 during a July 2001 sampling event. Earlier sampling events showed DCA present in concentrations orders of magnitude less than the July 2001 sampling event, indicating significant plume movement. The alluvial aquifer is known to be used for drinking water and currently meets recognized aquifer classifications as a drinking water aquifer. Groundwater is currently used for irrigation in the immediate vicinity of the site. At least two irrigation wells are known to be contaminated with hazardous substances associated with the site.

7.0 Human Health Risk Assessment

For the human health risk assessment (HHRA), the facility was evaluated based on the eight sites (Sites 1,2,3,4,5,6,8, and 9) that were defined during the RCRA Facility Investigation. The sites were grouped based on the exposure setting and the chemicals detected. Soil and sediment data were evaluated by site, while groundwater was evaluated separately as either perched groundwater or the alluvial aquifer groundwater. Framework for the HHRA was based upon the *Risk Assessment Workplan* (Ensafe 1998).

The list of chemicals detected in site media selected for inclusion in the quantitative HHRA was obtained by: (1) comparison of the site-related data to risk-based screening levels and (2) comparison to site related background concentrations. Risk-based screening values were from *USEPA Region 6 Human Health Medium-Specific Screening Levels* effective at the time of the evaluation. Compounds exceeding screening criteria are considered constituents of potential concern (COPC) and were carried through for further evaluated in the HHRA. COPCs are listed below.

Constituents of Potential Concern

Site	Surface Soil	Surface and Subsurface Soil	Sediment
1	arsenic, Dieldrin, 1,2-dichloroethane	arsenic, Dieldrin, 1,2-dichloroethane	arsenic, chromium
2	Aldrin, Dinoseb	Arsenic, cadmium, mercury, Aldrin, Dieldrin, 1,2-dichloroethane, carbon tetrachloride, chloroform, methylene chloride	NA
3	NA	Dinoseb	arsenic, Aldrin, Dieldrin, Toxaphene, pentachlorophenol
4	Dieldrin, Dinoseb	arsenic, Dieldrin, Dinoseb 3,4-dichloroaniline, 1,2-dichloroethane	NA
5	NA	arsenic, Dinoseb	NA
6	arsenic, Aldrin, Dieldrin, Methoxychlor, Toxaphene, Dinoseb	NA	NA
8	None	NA	NA
9	Heptachlor, Dinoseb, 3,4-dichloroaniline, Propanil	arsenic, Dinoseb, 3,4-dichloroaniline, Propanil, 1,2-dichloroethane	NA

Note: NA=no samples

COPCs identified for perched groundwater include: arsenic, lead, 4,4'-DDT, alpha-BHC, 1,4-dichlorobenzene, 2,6-dinitrotoluene, 4-chloroaniline, bis(2-chloroethyl)ether, 1,2-dichloroethane, 4-methyl-2-pentanone, acetone, benzene, chloroform, methylene chloride, and trichloroethene.

COPCs identified for the alluvial aquifer groundwater include: 1,1,2-trichloroethane, 1,2-dichlorobenzene, 1,2-dichloroethane, 1,2-dichloropropane, benzene, bromodichloromethane, chlorobenzene, chloroform, dibromochloromethane, methylene chloride, and vinyl acetate.

Risk was further evaluated considering current and future land uses for the following receptors: site workers, construction workers, trespassers, and off-site agriculture workers. Exposure pathways included one or more of the following: inhalation of gaseous contaminants released from soil, inhalation of chemicals entrained in fugitive dust, inhalation of gaseous contaminants released from groundwater, incidental ingestion, and dermal contact.

A contaminant was selected as a chemical of concern (COC) if its cancer risk exceeded 1E-6 or had a hazard quotient (HQ) greater than 1 for reasonable maximum exposures (RME). Chemicals of concern are listed on the following table.

Chemicals of Concern

Site	Surface Soil	Subsurface Soil	Sediment
1	None	None	arsenic
2	None	1,2-dichloroethane	N/A
3	N/A	Dinoseb	None
4	Dinoseb	3,4-dichloroaniline, Dinoseb	N/A
5	N/A	Dinoseb	N/A
6	None	N/A	N/A
9	Dinoseb, Propanil	3,4-dichloroaniline, Dinoseb, Propanil	N/A
Perched Groundwater	4-chloroaniline, 1,2-dichloroethane, methylene chloride		
Alluvial groundwater	benzene, chloroform, methylene chloride, 1,2-dichloroethane, 1,2-dichloropropane, and chlorobenzene		

Note: N/A=not applicable

Where reasonable maximum exposure estimates of risk indicated a significant threat would be posed, central tendency (CT) analysis was performed. A significant threat was defined as a cancer risk greater than 1E-4 or HQ greater than 1.

It was concluded that the alluvial groundwater risks based on the RME and CT exposure assumptions for the offsite agricultural worker represent the most substantial carcinogenic risks to human receptors contacting contaminated media associated with the site. Non-carcinogenic risk based on RME for all receptors are substantially high based primarily on construction worker exposures to Dinoseb in surface and subsurface soil at Sites 3, 4, and 9.(*Risk Assessment*, October 1999)

Noncarcinogenic risk estimated in the RA for the offsite agricultural worker exposed to volatile organic compounds released from the alluvial groundwater during irrigation CT exposure HQ were: 1,2-dichloroethane (1511), chlorobenzene (4), 1,2-dichloropropane (6), and benzene(8).

Carcinogenic risk estimated in the RA for the offsite agricultural worker exposed to volatile organic compounds released from the alluvial groundwater during irrigation were: 1,2-dichloroethane (1E-02), methylene chloride (5E-4) and benzene (2E-4).

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion and dermal contact with surface soil exposure pathways for the current/future on-site worker population. The following table provides the total risk and hazard index across all media and all exposure routes for on-site worker by Site (Ensafe, 1999). Refer to the 1999 Risk

Assessment for specific details on methodology Ensafe used to evaluate risk for current/future on-site workers. . (*Draft Conceptual Site Model*, EPA, 2003)

Summary of Current/Future On-site Worker Cancer Risks and Hazardous Indices Reasonable Maximum Exposure		
Site	**Total Risk Across All Media and All Exposure Routes**	**Total Hazard Index Across All Media and All Exposure Routes**
1	1E-04	<1
2	3E-06	<1
4	8.3E-06	<1
6	5E-06	<1
9	2E-05	254

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion, and dermal contact with surface/subsurface soil, incidental ingestion and dermal contact with sediment, and incidental ingestion and dermal contact with perched groundwater exposure pathways for the future on-site construction worker population. The following table provides the total risk and hazard index across all media and all exposure routes for on-site construction worker by Site (Ensafe, 1999). Refer to the 1999 Risk Assessment for specific details on methodology Ensafe used to evaluate risk for future on-site construction workers. . (*Draft Conceptual Site Model*, EPA, 2003)

Summary of Future Construction Worker Cancer Risks and Hazardous Indices Reasonable Maximum Exposure		
Site	**Total Risk Across All Media and All Exposure Routes**	**Total Hazard Index Across All Media and All Exposure Routes**
1	5.4E-05	21
2	6E-05	9
3	4.5E-07	40
4	3E-07	13
5	2.9E-07	<1
6	7.2E-08	<1
9	2E-07	91

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion and dermal contact with surface soil, incidental ingestion and dermal contact with sediment exposure pathway for the future site trespasser population. The following table provides the total risk and hazard index across all media and all exposure routes for site

trespasser by Site (Ensafe, 1999). Refer to the 1999 Risk Assessment for specific details on methodology Ensafe used to evaluate risk for future trespassers. . (*Draft Conceptual Site Model*, EPA, 2003)

Summary of Future Trespasser Cancer Risks and Hazardous Indices Reasonable Maximum Exposure		
Site	**Total Risk Across All Media and All Exposure Routes**	**Total Hazard Index Across All Media and All Exposure Routes**
1	7E-05	<1
2	4E-07	<1
3	1.6E-05	<1
4	3E-06	<1
6	6E-07	<1
9	3E-06	82

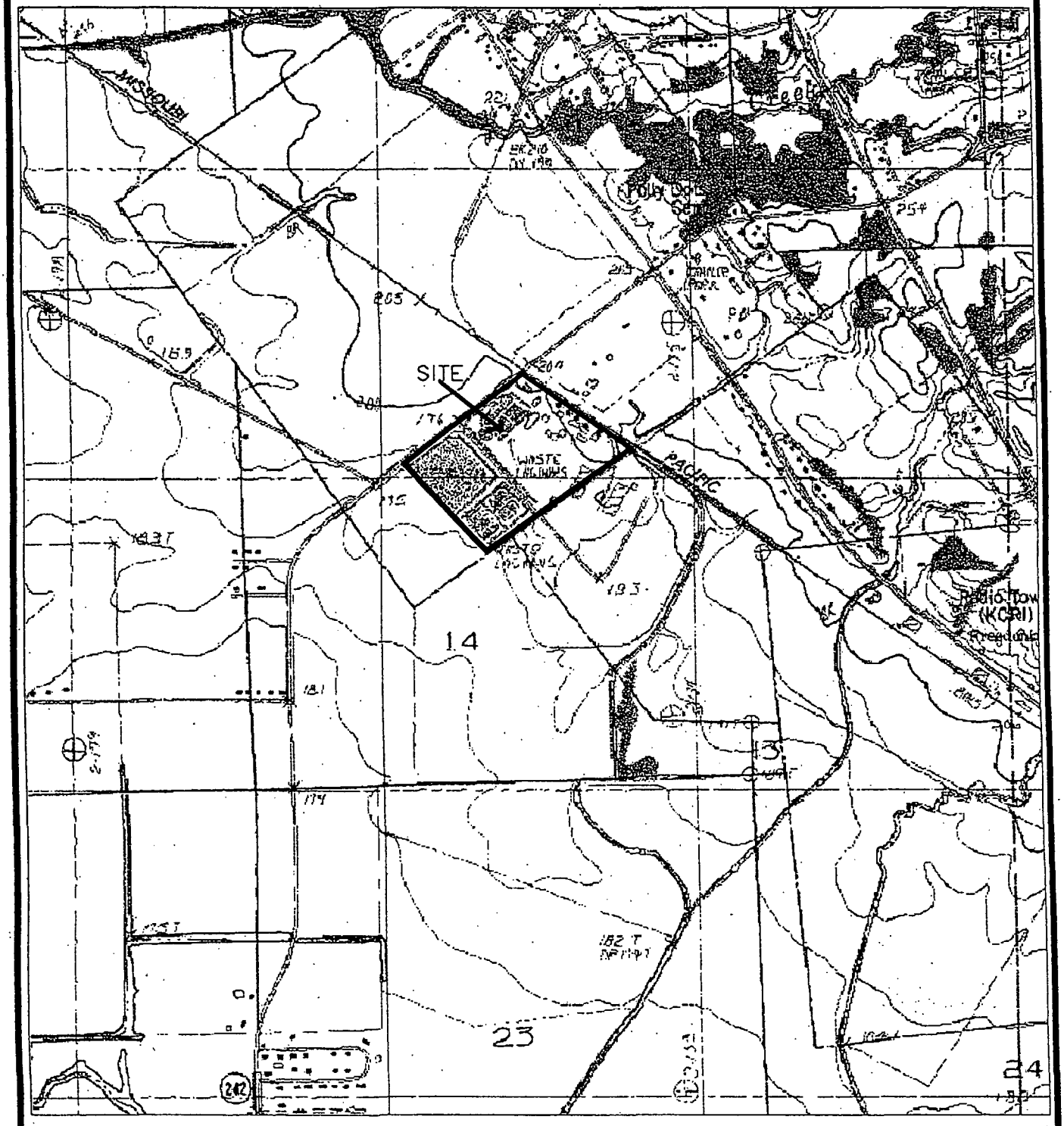
ADEQ and representatives of CCC met on March 1, 2001, to discuss risk issues and it was agreed that additional investigations were necessary to refine the RA. Samples were collected from eight irrigation wells in July 2001. Two offsite irrigation wells (in addition to offsite facility monitoring wells) were found to be contaminated with 1,2-dichloroethane. The impacted irrigation wells were identified as AGI-1 (located approximately 3500 feet south of the site) and the BHA-1 located (located approximately 240 feet southeast of the site). Risk was re-evaluated based upon actual data from the irrigation wells. Noncarcinogenic risk to the offsite agricultural worker exposed to contaminants emanating from both AGI-1 and BHA-1 are less than HQ 1. Carcinogenic risks are 7E-06 for the worker exposed to groundwater from AGI-1 and 5E-06 or the worker exposed to groundwater from BHA-1. This reevaluation of risk was presented in the *Risk Assessment Addendum*, January 2002.

8.0 Ecological Risk Assessment

Arsenic, Aldrin, Dieldrin, 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT), Endrin, gamma-BHC, Methoxychlor, and Toxaphene were detected in sediment at Area I above the EPA Region 4 sediment screening values. Two potential receptors (tadpoles and piscivorus birds) were identified in the 1999 Risk Assessment. Tadpoles in the ditches may potentially be exposed to contaminated sediment identified in the ditches. Because of the nature of contamination in sediment, bioaccumulation is possible. In addition, piscivorus birds may also ingest tadpoles with elevated levels of pesticides. However, the 1999 Risk Assessment indicates the potential risk in Area I was considered acceptable because the ditches are used as an integral component of the facility's wastewater treatment system. Due to the function of these ditches, standing water is frequently drained and, thus, any emerging aquatic habitat was considered opportunistic (Ensafe, 1999).

No potentially complete ecological exposure pathways for Area II were identified in the 1999 Risk Assessment (Ensafe, 1999).

In Area III, an ecological potential pathway identified in the 1999 Risk Assessment included receptors exposed to contaminated groundwater during irrigation activities. However, ecological risks were not evaluated since no data was available from the irrigation wells at the time the 1999 Risk Assessment was conducted. The risk assessment indicated that only small mammals and birds species are present in Area III. The risk assessment indicated that during hot summer months when irrigation is frequent, wildlife species are likely dormant during the heat of the day and seek refuge in wooded areas. Thus, exposure to contaminated groundwater during irrigation events was not anticipated to be significant for potential ecological receptors (Ensafe, 1999).



LOCATION MAP OF CEDAR CHEMICAL
WEST HELENA, ARKANSAS (WEST HELENA QUAD-1988)
FIGURE 1

Date: JANUARY 27, 2003

Drawn By: AER

BOOZ|ALLEN|HAMILTON

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Atlanta, Georgia 30303
(404) 659-3600 FAX (404) 589-7050

N

NOT TO SCALE
(Based on 1:25,000 scale)

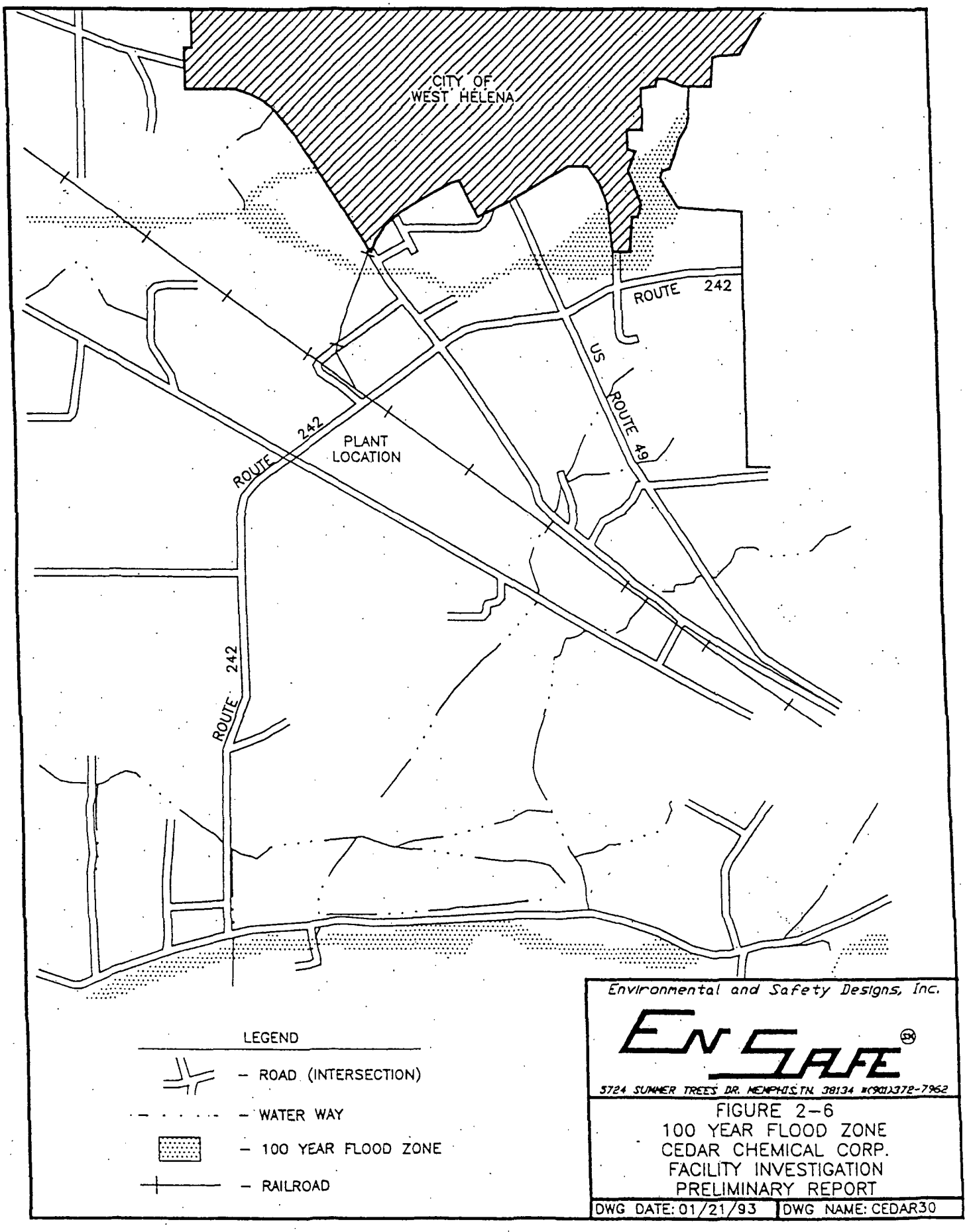

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FIGURE 2-6
100 YEAR FLOOD ZONE
CEDAR CHEMICAL CORP.
FACILITY INVESTIGATION
PRELIMINARY REPORT

DWG DATE: 01/21/93 | DWG NAME: CEDAR30

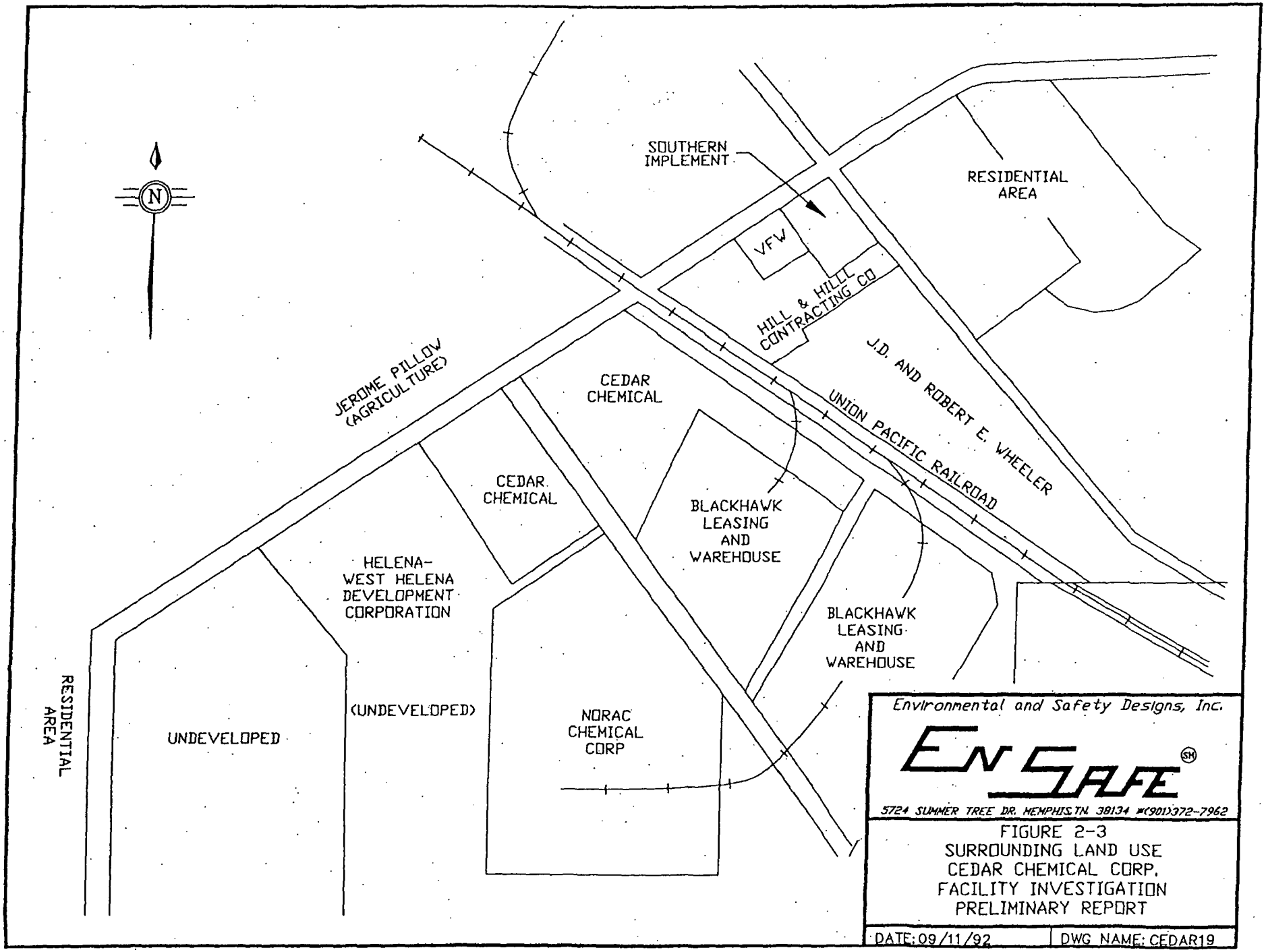
N
SOUTHERN IMPLEMENT
RESIDENTIAL AREA
VFW
HILL & HILL CONTRACTING CO
J.D. AND ROBERT E. WHEELER
UNION PACIFIC RAILROAD
JEROME PILLOW (AGRICULTURE)
CEDAR CHEMICAL
CEDAR CHEMICAL
BLACKHAWK LEASING AND WAREHOUSE
HELENA-WEST HELENA DEVELOPMENT CORPORATION
BLACKHAWK LEASING AND WAREHOUSE
RESIDENTIAL AREA
UNDEVELOPED
(UNDEVELOPED)
NORAC CHEMICAL CORP
Environmental and Safety Designs, Inc.
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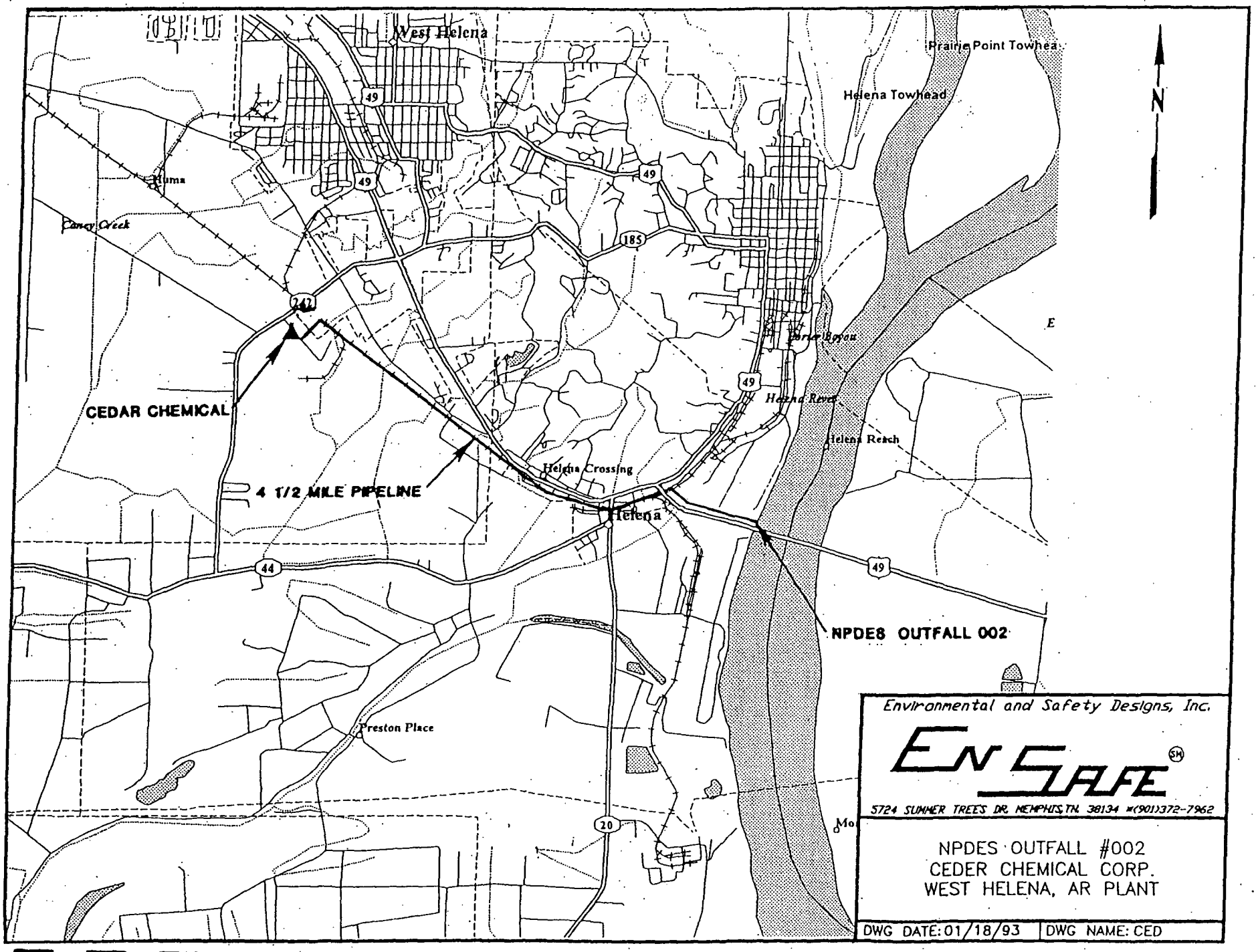
FIGURE 2-3
SURROUNDING LAND USE
CEDAR CHEMICAL CORP.
FACILITY INVESTIGATION
PRELIMINARY REPORT
DATE: 09/11/92
DWG NAME: CEDAR19


West Helena
Prairie Point Towhea
Helena Towhead
N
49
Huma
Cancy Creek
185
242
CEDAR CHEMICAL
4 1/2 MILE PIPELINE
Helena Crossing
Helena
Helena Reach
44
NPDES OUTFALL 002
Preston Place
20
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS, TN. 38134 (901)372-7962
NPDES OUTFALL #002
CEDER CHEMICAL CORP.
WEST HELENA, AR PLANT
DWG DATE: 01/18/93
DWG NAME: CED

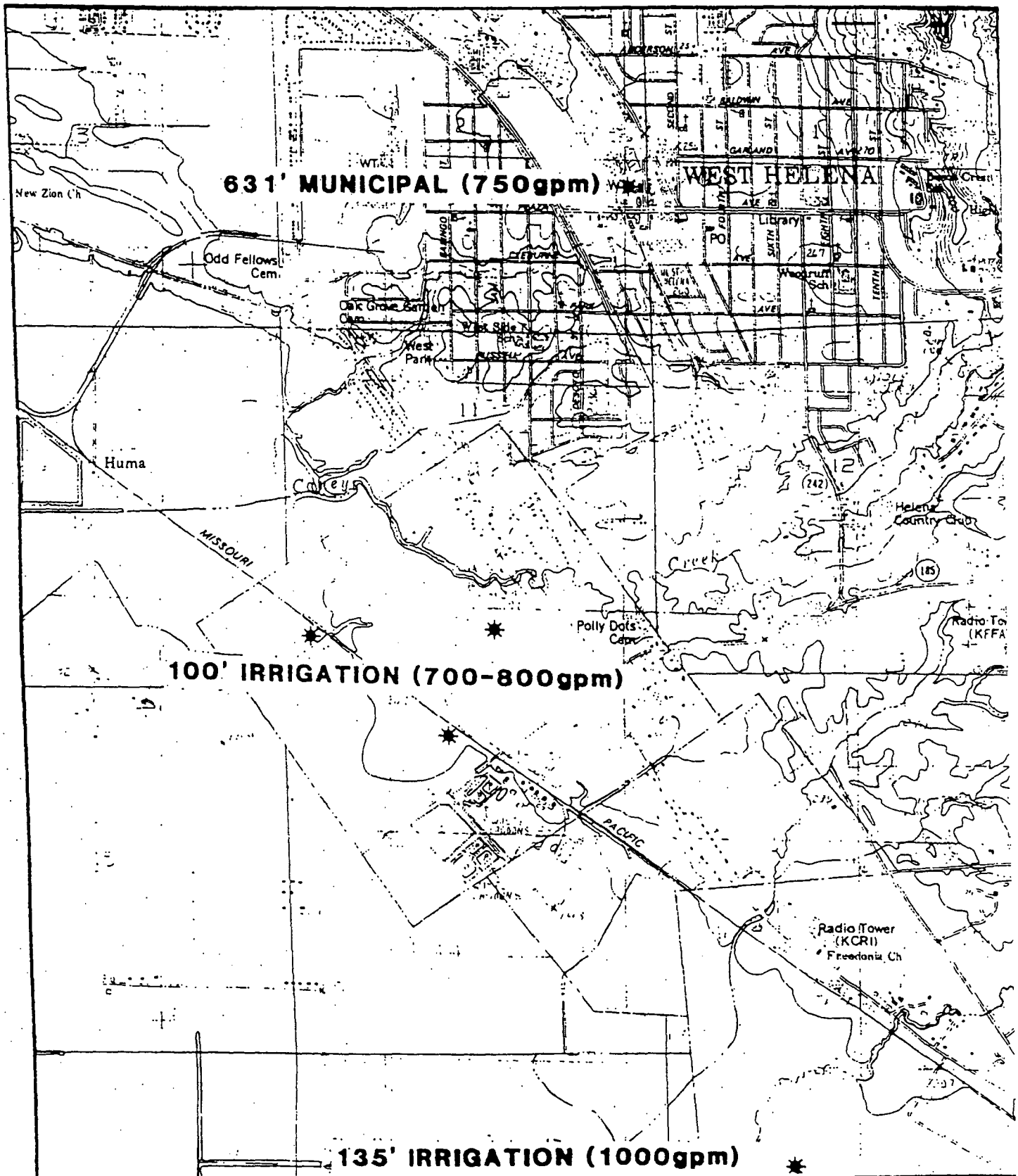


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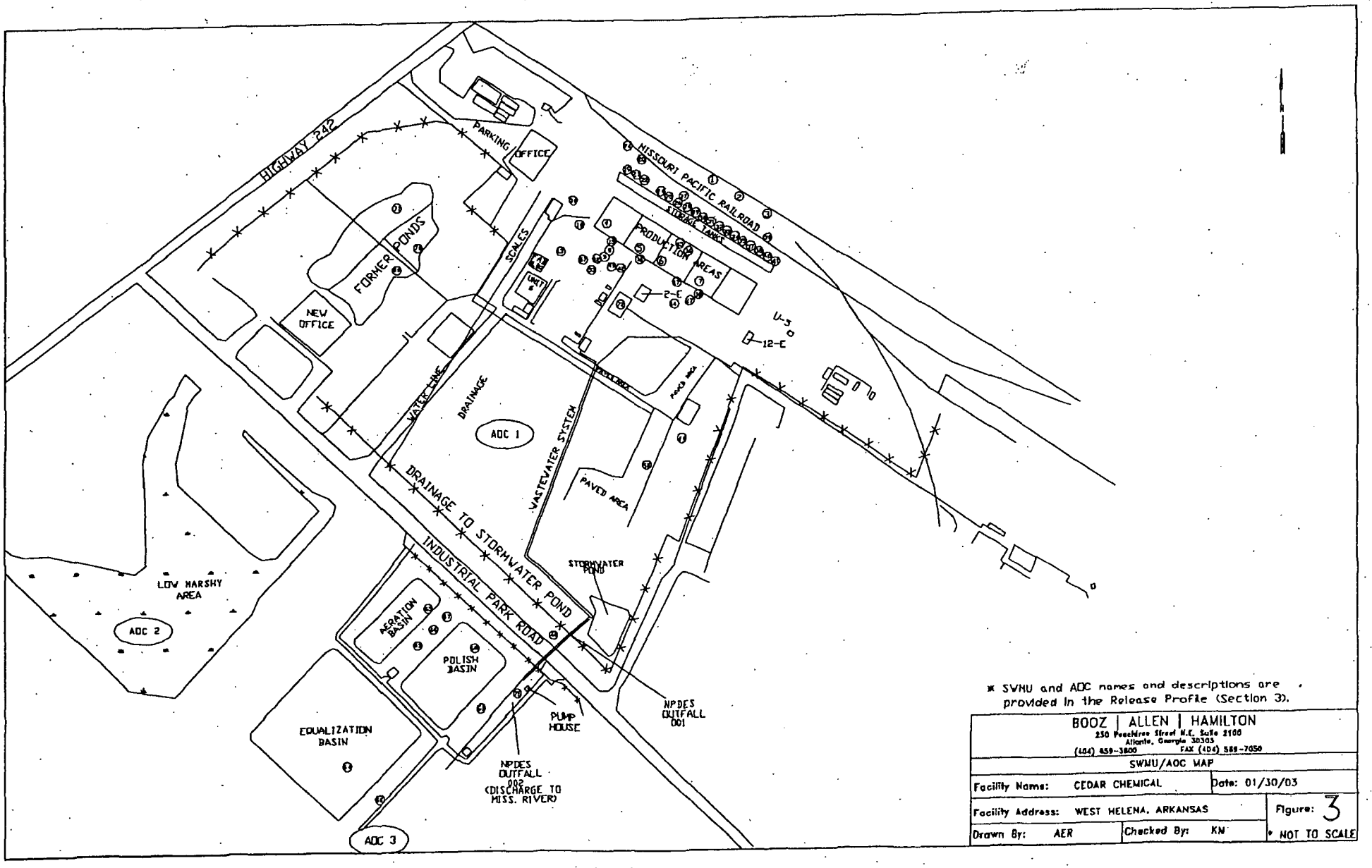
FIGURE 2-4
SURROUNDING WATER USE
CEDAR CHEMICAL CORP.
FACILITY INVESTIGATION
PRELIMINARY REPORT

DATE: 09/09/91

DWG NAME: CEDAR21



* SWMU and AOC names and descriptions are provided in the Release Profile (Section 3).

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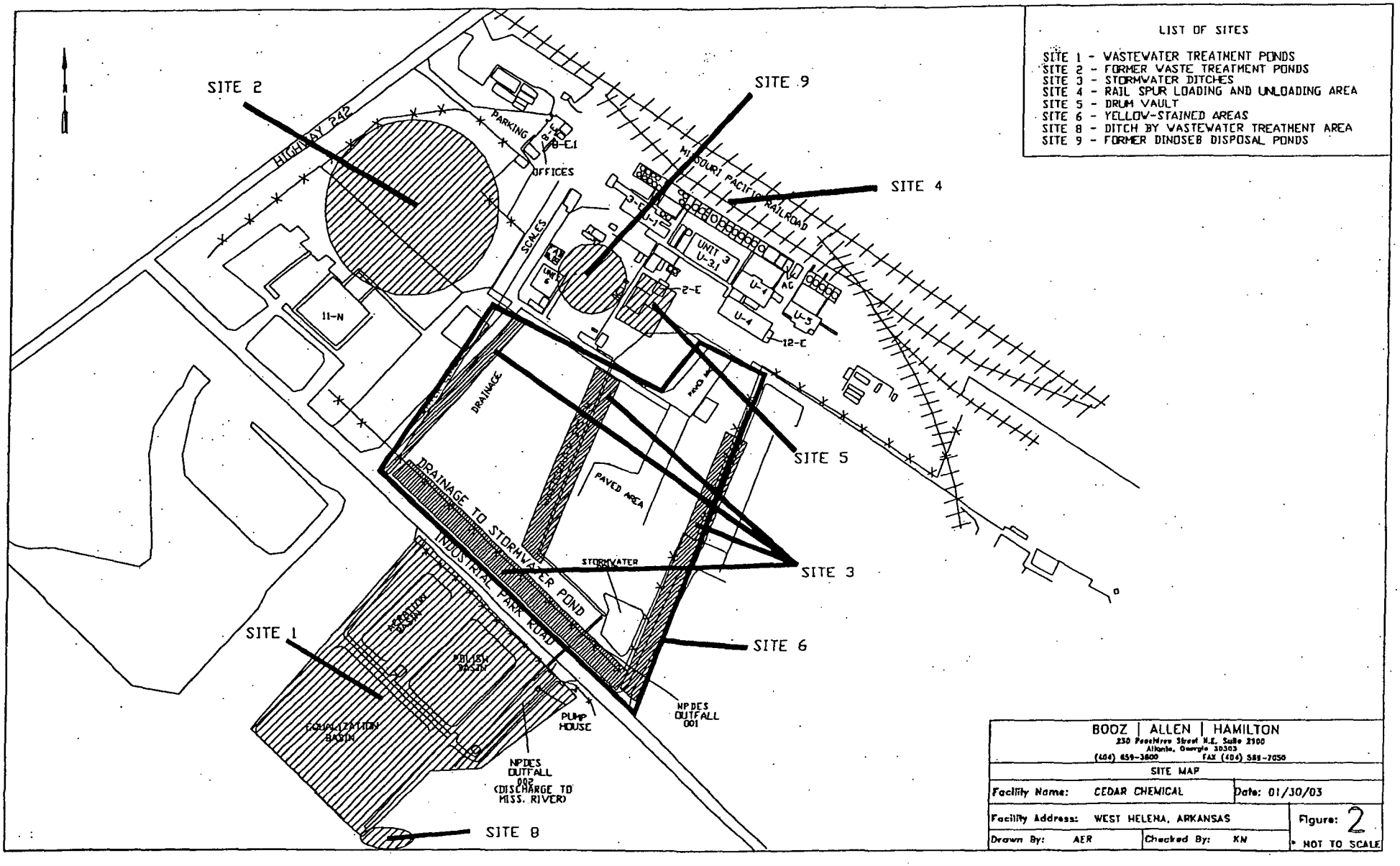
SWMU/AOC MAP

Facility Name:	CEDAR CHEMICAL	Date: 01/30/03	
Facility Address:	WEST HELENA, ARKANSAS	Figure: 3	
Drawn By: AER	Checked By: KN	* NOT TO SCALE	


LIST OF SITES
SITE 1 - WASTEWATER TREATMENT PONDS
SITE 2 - FORMER VASTE TREATMENT PONDS
SITE 3 - STORMWATER DITCHES
SITE 4 - RAIL SPUR LOADING AND UNLOADING AREA
SITE 5 - DRUM VAULT
SITE 6 - YELLOW-STAINED AREAS
SITE 8 - DITCH BY WASTEWATER TREATMENT AREA
SITE 9 - FORMER DINOSEB DISPOSAL PONDS
SITE 2
SITE 9
SITE 4
SITE 5
SITE 3
SITE 6
SITE 1
SITE 8
HIGHWAY 242
PARKING
OFFICES
SCALES
MISSOURI PACIFIC RAILROAD
UNIT 3
U-3.1
U-1
U-4
U-5
AG
11-N
12-E
DRAINAGE
PAVED AREA
DRAINAGE TO STORMWATER POND
INDUSTRIAL PARK ROAD
STORMWATER
EQUALIZATION BASIN
POLISH BASIN
FOUNDATION BASIN
PUMP HOUSE
NPDES OUTFALL 001
NPDES OUTFALL 002 (DISCHARGE TO MISS. RIVER)
BOOZ | ALLEN | HAMILTON
230 Peachtree Street N.E. Suite 2100
Atlanta, Georgia 30303
(404) 659-3800 FAX (404) 589-7050
SITE MAP
Facility Name: CEDAR CHEMICAL
Date: 01/30/03
Facility Address: WEST HELENA, ARKANSAS
Figure: 2
Drawn By: AER
Checked By: KN
* NOT TO SCALE

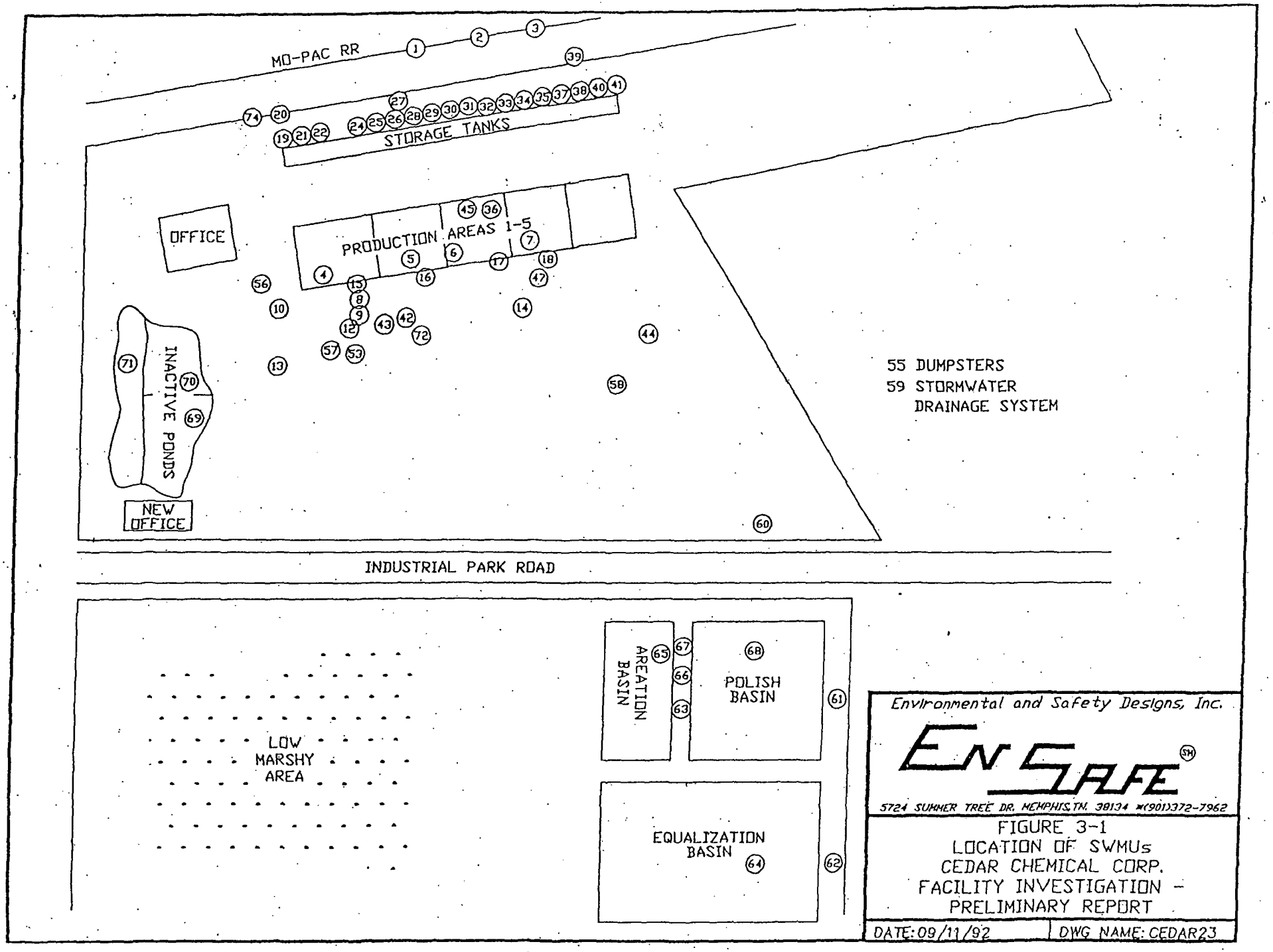


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FIGURE 3-1
LOCATION OF SWMUs
CEDAR CHEMICAL CORP.
FACILITY INVESTIGATION -
PRELIMINARY REPORT

DATE: 09/11/92 | DWG NAME: CEDAR23

3.2.17 Area of Concern #2: Wetland Adjacent to Biological Treatment Ponds

This area is a topographically low area adjacent to the berm on the north side of the biological treatment ponds. The area was formed by the removal of soil to build the berms around the treatment ponds. There is also a berm around the wetland that is believed to serve as an emergency release catch basin; however, Cedar Chemical personnel are not aware of any events in which waste was diverted to this area.

Releases to soil, subsurface gas, groundwater or air are unlikely since there is no evidence that waste have ever been handled in this area.

3.2.18 Area of Concern #3: Industrial Park Ditch Adjacent to API Separator

This area is a ditch located on the south side of the Biological Treatment Ponds which carries stormwater discharged from NPDES Outfall #001 to the White River. In the past the API Separator would periodically overflow and wastewater destined for the treatment ponds would down the backside of the equalization pond berm in the industrial park ditch to the White River. In order to remediate this problem the separator and pad were cleaned and a gutter was installed to divert all overflow into the equalization pond in February 1992. The contaminated soil in the ditch was also removed, placed in drums and sent to the Chemical Waste Management Subtitle C landfill in Carlyss, Louisiana; however, no confirmatory sampling of the ditch was performed.

Releases to the soil, surface water, air and groundwater in this unit are possible since overflow events from the API Separator have been documented. Soil cleanup in this area has been performed, but confirmatory sampling will be required to determine if the cleanup activities were adequate.

Table 3-1
Solid Waste Management Units
Cedar Chemical Company

SWMU NUMBER	NAME	STATUS
1 & 2	Railroad Loading and Unloading Sumps	InActive
3	Railroad Loading and Unloading Sump	Inactive
4	Production Areas #1 and #2 Drainage System and Sump	Active
5	Production Area #3 Drainage System and Sump	Removed
6	Production Area #4 Drainage System and Sump	Active
7	Production Area #5 Drainage System and Sump	Inactive

Table 3-1
Solid Waste Management Units
Cedar Chemical Company

SWMU NUMBER	NAME	STATUS
8	Boiler Blowdown Area Sump #1	Active
9	Boiler Blowdown Area Sump #2	Active
10	Laboratory Sump	Active
11	Sump Near Main Tank Farm	Active
12	Maintenance Shop Drainage System and Sump	Active
13	Truck Scale Sump	Active
14	Packaging Building Sump	Active
15-16	Air Emissions Scrubbers #01, #02	Active
17	Air Emissions Scrubber #03	Removed
18	Air Emissions Scrubber #04	Active
19	Sump in Main Tank Farm Diked Area #1 (North)	Active
20	Sump in Main Tank Farm Diked Area #1 (South)	Active
21	Sump in Main Tank Farm Diked Area #2	Active
22	Sump in Main Tank Farm Diked Area #3	Active
23	Waste Storage Tank PE-209 in Main Tank Farm Diked Area #4	Removed
24	Waste Storage Tank 002 in Main Tank Farm Diked Area #5	Inactive
25	Sump in Main Tank Farm Diked Area #6	Inactive
26	Sump in Main Tank Farm Diked Area #7	Active
27	Tank B-109 in Main Tank Farm Diked Area #7	Inactive
28	Waste Storage Tank B-112 in Main Tank Farm Diked Area #8	Inactive
29	Sump in Main Tank Farm Diked Area #9	Inactive
30	Waste Water Storage Tank B-102 in Main Tank Farm Diked Area #10	Active
31	Sump in Main Tank Farm Diked Area #11	Active
32	Sump in Main Tank Farm Diked Area #12	Inactive
33	Tank N-204 in Main Tank Farm Diked Area #13	Active

Table 3-1
Solid Waste Management Units
Cedar Chemical Company

SWMU NUMBER	NAME	STATUS
34	Tank N-201 in Main Tank Farm Diked Area #14	Active
35	Tank N-205 in Main Tank Farm Diked Area #15	Active
36	Tank N-206 in Production Area #4	Active
37	Sump in Main Tank Farm Diked Area #16	Inactive
38	Sump in Main Tank Farm Diked Area #17	Inactive
39	Tank M-105 in Main Tank Farm Diked Area #17	Inactive
40	Sump in Main Tank Farm Diked Area #18	Inactive
41	Sump in Main Tank Farm Diked Area #19	Inactive
42	Sump in Second Tank Farm Diked Area #1	Active
43	Wastewater Tank 014 in Second Tank Farm Diked Area #3	Removed
44	Hazardous Waste Drum Storage Area	Active
45	Nonhazardous Waste Drum Storage Staging Area	Active
46	Drum Storage Area	Removed
47	Drum Crushing Area	Active
48	Waste Drum Staging Area	Removed
49	Scrap Drum Storage Wagons	Removed
50	Waste Drum Staging Area in Main Tank Farm Area	Removed
51	Waste Oil Drum	Removed
52	Drums	Removed
53	Solvent Cleaner Tank	Active
54	Miscellaneous Drum Storage	Removed
55	Dumpsters	Active
56	Laboratory Waste Rack Area	Active
57	Warehouse Drum Storage Area	Inactive
58	Loading/Unloading Dock Area	Active
59	Stormwater Drainage System	Active
60	Stormwater Sump	Active

Table 3-1
Solid Waste Management Units
Cedar Chemical Company

SWMU NUMBER	NAME	STATUS
61	Wastewater Tank #1 Wastewater Treatment System	Inactive
62	API Separator	Active
63	Wastewater Tank #2 Wastewater Treatment System	Active
64	Flow Equalization Basin	Active
65	Aeration Basin	Active
66	Clarifier #1	Active
67	Clarifier #2	Active
68	Polish Pond	Active
69	Inactive Pond #1	Inactive
70	Inactive Pond #2	Inactive
71	Inactive Pond #3	Inactive
72	Drum Vault	Inactive
73	Buried Drums	Removed
74	Loading/Unloading Area (Railroad Spur)	Active
75	NPDES Outfall #002 Piping	Active
76	Production Unit Wastewater Piping	Active
77	Production Unit Sumps	Active
78	Abandoned Wastewater Piping	Removed
79-80	Air Emissions Scrubber #05 and #06	Active

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2MW-3 (20-25')	2MW-3 (30-35')
Volatiles (ppb)		
Benzene	U	U
1,2-Dichloroethane	74	110
2-Pentanone	50	1,000
Toluene	140	190
Chlorobenzene	U	U
Xylene	U	U
Carbon Tetrachloride	U	U
Acetone	3,100	2,700
Chloroform	390	10
Methylene Chloride	890	26
1,2-Dichloropropane	U	U
2-Butanone	35	U
Semivolatiles (ppb)		
4-Nitrophenol	1,600	U
Phenol	49,000	U
Bis-(2-chloroethyl)ether	U	U
1,2,4-Trichlorobenzene	U	U
Benzoic Acid	U	U
Propanil	190	120
Di-n-butyl Phthlalate	U	320
2-Nitrophenol	U	U
Dinoseb	U	U
2-Chloronaphthalene	U	U
1,2-Dichlorobenzene	U	U
3,4-Dichloroaniline	310	250
Pesticides (ppb)		
Aldrin	U	U
alpha-BHC	U	U
beta-BHC	U	U
4,4'-DDT	U	U
Endrin	U	U
Methoxychlor	U	U
Heptachlor	U	U
Metals (ppm)		
Lead	10	7
Arsenic	11	6
Barium	133	88
Cadmium	0	U
Chromium	15	8
Selenium	U	U

Note:
U Not detected above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2MW-1 (20-25')	2MW-1 (30-35')	2MW-2 (5-10')	2MW-2 (15-20')	2MW-3 (15-30')
Volatiles (ppb)					
Benzene	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	35
2-Pentanone	U	33	U	U	9
Toluene	U	U	U	U	29
Chlorobenzene	U	U	U	U	U
Xylene	U	U	U	U	3
Carbon Tetrachloride	U	U	U	U	U
Acetone	U	13	U	U	35
Chloroform	U	U	U	U	190
Methylene Chloride	25,000	160	U	U	250
1,2-Dichloropropane	U	U	U	U	U
2-Butanone	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
Phenol	750	170	U	U	2,700
Bis-(2-chloroethyl)ether	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Benzoic Acid	540	U	U	U	U
Propanil	260	U	460	U	90
Di-n-butyl Phthlalate	U	95	U	U	U
2-Nitrophenol	U	U	U	U	U
Dinoseb	U	U	U	U	U
2-Chloronaphthalene	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	U	390	U	U
Pesticides (ppb)					
Aldrin	U	U	U	U	U
alpha-BHC	U	U	4	U	U
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	U	U	U	U
Heptachlor	U	U	U	U	U
Metals (ppm)					
Lead	7	9	21	15	10
Arsenic	9	5	8	12	11
Barium	158	84	197	178	151
Cadmium	U	0	U	1	U
Chromium	11	14	15	18	14
Selenium	U	U	U	U	U

Note:
U Not detected above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2SB-11 (20-25')	2SB-11 (25-30')	2SB-12 (15-20')	2SB-12 (25-30')	2MW-1 (15-20')
Volatiles (ppb)					
Benzene	U	U	U	U	U
1,2-Dichloroethane	40	170	3,400	63	43
2-Pentanone	U	U	U	60	U
Toluene	90	180	170	30	U
Chlorobenzene	U	U	U	U	U
Xylene	7	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U
Acetone	84	17,000	U	7,400	U
Chloroform	39	2,700	620	1,100	U
Methylene Chloride	340	U	45,000	4,100	320
1,2-Dichloropropane	U	U	U	U	U
2-Butanone	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	180	560	9,200	710	U
Phenol	280	460	100,000	6,900	U
Bis-(2-chloroethyl)ether	U	U	U	180	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	6,400	300	79,000	670	330
Di-n-butyl Phthlalate	130	150	3,200	U	110
2-Nitrophenol	U	U	U	150	U
Dinoseb	U	U	9,800	U	U
2-Chloronaphthalene	U	U	5,400	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	7	U	U	U	U
4,4'-DDT	U	U	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	U	22,000	63,000	U
Heptachlor	U	U	U	U	U
Metals (ppm)					
Lead	18	13	8	8	9
Arsenic	9	20	8	24	11
Barium	188	172	153	85	187
Cadmium	1	0	U	0	1
Chromium	18	20	13	13	10
Selenium	U	U	U	U	U

Note:
U Not detected above PQLs

Table 5-3
Cedar Chemical
Phase II Facility Investigation
Site 1 - Soil Data

Compound	1MW-7 (0-3')	1HA-7 (2-3')	1HA-7 (5-6')	1SB-1 (0-2')	1SB-1 (12-14')
Volatiles (ppb)					
Acetone	U	U	U	190	100
1,2-Dichloroethane	16	U	U	U	U
Toluene	6	U	U	U	U
Xylenes (total)	15	U	U	U	U
Pesticides (ppb)					
4,4'-DDT	U	U	U	4	U
4,4'-DDE	U	23	13	10	U
4,4'-DDD	U	19	20	U	U

Note:

U Not quantified above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2SB-1 (15-20')	2SB-1 (25-30')	2SB-2 (20-25')	2SB-2 (25-30')	2SB-3 (13-14')
Volatiles (ppb)					
Benzene	U	U	U	U	1
1,2-Dichloroethane	3,300	4,100	70,000	9,600	12
2-Pentanone	U	U	U	U	67
Toluene	U	U	U	U	3
Chlorobenzene	U	U	U	U	U
Xylene	U	450	U	U	7
Carbon Tetrachloride	U	U	U	U	U
Acetone	1,500	U	U	1,100	25
Chloroform	U	U	U	U	U
Methylene Chloride	13,000	110,000	45,000	40,000	68
1,2-Dichloropropane	U	U	U	U	U
2-Butanone	U	1,600	U	U	22
Semivolatiles (ppb)					
4-Nitrophenol	67	46	12,000	2,900	25,000
Phenol	440	580	540	360	U
Bis-(2-chloroethyl)ether	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	200	100	240	U	11,000
Di-n-butyl Phthlalate	70	53	U	120	U
2-Nitrophenol	U	U	400	U	720
Dinoseb	U	U	850	180	29,000
2-Chloronaphthalene	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	U	U	U	U
Heptachlor	U	U	U	U	U
Metals (ppm)					
Lead	12	8	12	8	11
Arsenic	11	4	9	5	9
Barium	140	151	205	133	228
Cadmium	0	1	U	U	U
Chromium	14	9	15	12	11
Selenium	U	U	U	U	U

Note:
U Not detected above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2SB-3 (24-25')	2SB-4 (15-20')	2SB-4 (25-30')	2SB-5 (15-20')	2SB-5 (25-30')
Volatiles (ppb)					
Benzene	620	10	U	120	U
1,2-Dichloroethane	620	270	2,600	1,800	110,000
2-Pentanone	1,200	180	U	20	U
Toluene	U	1,200	U	27	U
Chlorobenzene	U	25	U	14	U
Xylene	620	49	U	550	U
Carbon Tetrachloride	U	U	U	U	U
Acetone	U	1,000	2,600	150	U
Chloroform	620	18	U	250	U
Methylene Chloride	8,100	1,200	100,000	1,900	380,000
1,2-Dichloropropane	U	U	U	32	U
2-Butanone	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	22,000	U	120	9,200	3,100
Phenol	U	U	1,000	U	U
Bis-(2-chloroethyl)ether	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	2,000	U	100	1,200	6,400
Di-n-butyl Phthlalate	U	80	100	U	U
2-Nitrophenol	U	U	U	U	U
Dinoseb	U	U	U	U	49,000
2-Chloronaphthalene	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Aldrin	U	U	U	U	140
alpha-BHC	U	10	U	U	44
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
Endrin	U	U	U	U	75
Methoxychlor	U	230	U	160,000	160,000
Heptachlor	U	U	U	U	81
Metals (ppm)					
Lead	11	14	13	7	14
Arsenic	8	7	15	9	6
Barium	145	219	126	152	181
Cadmium	U	U	1	U	1
Chromium	12	17	12	10	16
Selenium	U	U	U	U	U

Note:
U Not detected above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2SB-6 (21-22')	2SB-6 (28-29')	2SB-7 (10-15')	2SB-7 (15-30')	2SB-8 (15-20')
Volatiles (ppb)					
Benzene	U	U	U	U	U
1,2-Dichloroethane	32,000	170,000	11	U	130
2-Pentanone	U	U	12	U	27
Toluene	U	U	4	20,000	85
Chlorobenzene	U	U	U	U	13
Xylene	U	4,800	U	U	U
Carbon Tetrachloride	U	U	U	U	U
Acetone	U	U	210	2,400	980
Chloroform	U	2,800	U	260	50
Methylene Chloride	170,000	82,000	46	U	1,100
1,2-Dichloropropane	U	U	U	U	U
2-Butanone	U	U	21	U	U
Semivolatiles (ppb)					
4-Nitrophenol	4,200	9,700	U	1,100	880
Phenol	330	U	U	U	3,100
Bis-(2-chloroethyl)ether	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	670	11,000	270	U	2,100
Di-n-butyl Phthlalate	U	U	74	U	220
2-Nitrophenol	U	U	U	53	89
Dinoseb	10,000	93,000	U	U	U
2-Chloronaphthalene	U	U	U	72	U
1,2-Dichlorobenzene	U	U	U	U	150
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Aldrin	U	500	U	U	U
alpha-BHC	U	210	14	U	30
beta-BHC	U	U	U	U	U
4,4'-DDT	U	870	U	U	U
Endrin	U	680	U	U	U
Methoxychlor	16,000	290,000	U	17,000	U
Heptachlor	U	270	U	U	U
Metals (ppm)					
Lead	17	13	14	17	9
Arsenic	19	4	11	12	7
Barium	178	99	197	102	180
Cadmium	U	1	0	0	U
Chromium	15	14	14	18	9
Selenium	U	U	U	U	U

Note:
U Not detected above PQLs

Table 5-4
Cedar Chemical
Phase I Facility Investigation
Site 2 Soil Data

Compound	2SB-8 (25-30')	2SB-9 (4-5')	2SB-9(26-27')	2SB-10 (15-20)	2SB-10 (25-30')
Volatiles (ppb)					
Benzene	17	2	420	U	U
1,2-Dichloroethane	220	14	2,900	U	U
2-Pentanone	79	U	U	U	20
Toluene	1,200	15	5,000	390,000	1,100
Chlorobenzene	100	3	530	U	U
Xylene	170	15	2,600	2,800	U
Carbon Tetrachloride	U	U	670	U	U
Acetone	10,000	26	U	U	240
Chloroform	1,100	2	13,000	U	64
Methylene Chloride	2,100	28	93,000	U	370
1,2-Dichloropropane	U	U	U	U	U
2-Butanone	U	U	U	1,700	U
Semivolatiles (ppb)					
4-Nitrophenol	900	1,200	320	U	U
Phenol	22,000	3,300	1,500	2,500	U
Bis-(2-chloroethyl)ether	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	1,200	U
Propanil	4,800	10,000	8,600	47,000	93
Di-n-butyl Phthlalate	U	U	U	U	U
2-Nitrophenol	400	U	U	2,900	U
Dinoseb	510	1,100	920	990	U
2-Chloronaphthalene	U	U	310	850	U
1,2-Dichlorobenzene	1,100	5,300	12,000	11,000	U
3,4-Dichloroaniline	U	U	U	5,300	U
Pesticides (ppb)					
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	1,900	240,000	U	U	U
Heptachlor	U	U	U	U	U
Metals (ppm)					
Lead	11	9	17	12	14
Arsenic	28	11	9	9	10
Barium	174	89	184	202	109
Cadmium	U	1	U	1	U
Chromium	20	11	15	13	20
Selenium	1	1	U	U	U

Note:
U Not detected above PQLs

Table 5-5
Cedar Chemical
Phase II Facility Investigation
Site 2 - Soil Data

Compound	2MW-7 (0-5')	2MW-7 (5-10')	2MW-7 (20-25')	2SB-13 (0-2')	2SB-13 (8-10')	2SB-13 (10-12')
Volatiles (ppb)						
Acetone	U	840	1,200	U	820	1,600
1,2-Dichloroethane	U	U	U	U	810	740
Chlorobenzene	U	U	U	U	24	30
Methylene Chloride	U	U	U	U	4,000	3,600
Xylene (total)	U	U	U	U	38	U
Semivolatiles (ppb)						
Dinoseb	U	U	U	U	580	U
Pesticides (ppb)						
Methoxychlor	180	280,000	U	260	U	U
Aldrin	U	U	U	U	U	U
4,4'-DDT	U	U	U	U	U	U
4,4'-DDD	U	49	U	U	U	U

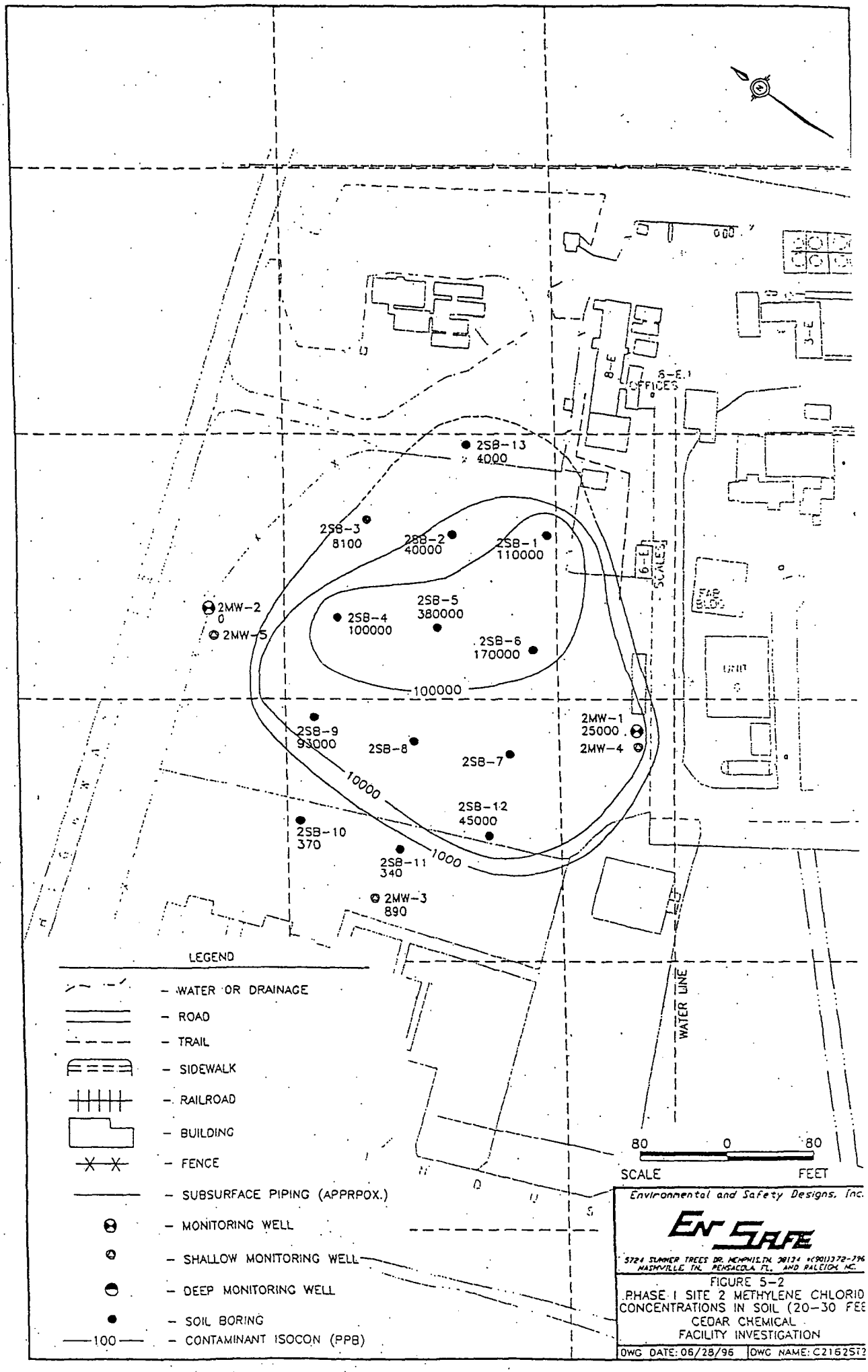
Note:

U Not quantified above PQLs

Table 5-6
Cedar Chemical
Phase III Facility Investigation
Site 2 Soil Data

Compound	2SB-14 (8-10')	2SB-15 (0-2')	2SB-15 (8-10')
Pesticides (ppb)			
Aldrin	U	11	16
Dieldrin	U	U	9.5
4,4'-DDE	U	11	U
4,4'-DDD	U	15	U
4,4'-DDT	U	20	11
Endrin	U	7	U
Methoxychlor	U	55	U
Endosulfan Sulfate	U	U	17
Endrin Keytone	U	U	6.4

Notes:
U Not detected above PQLs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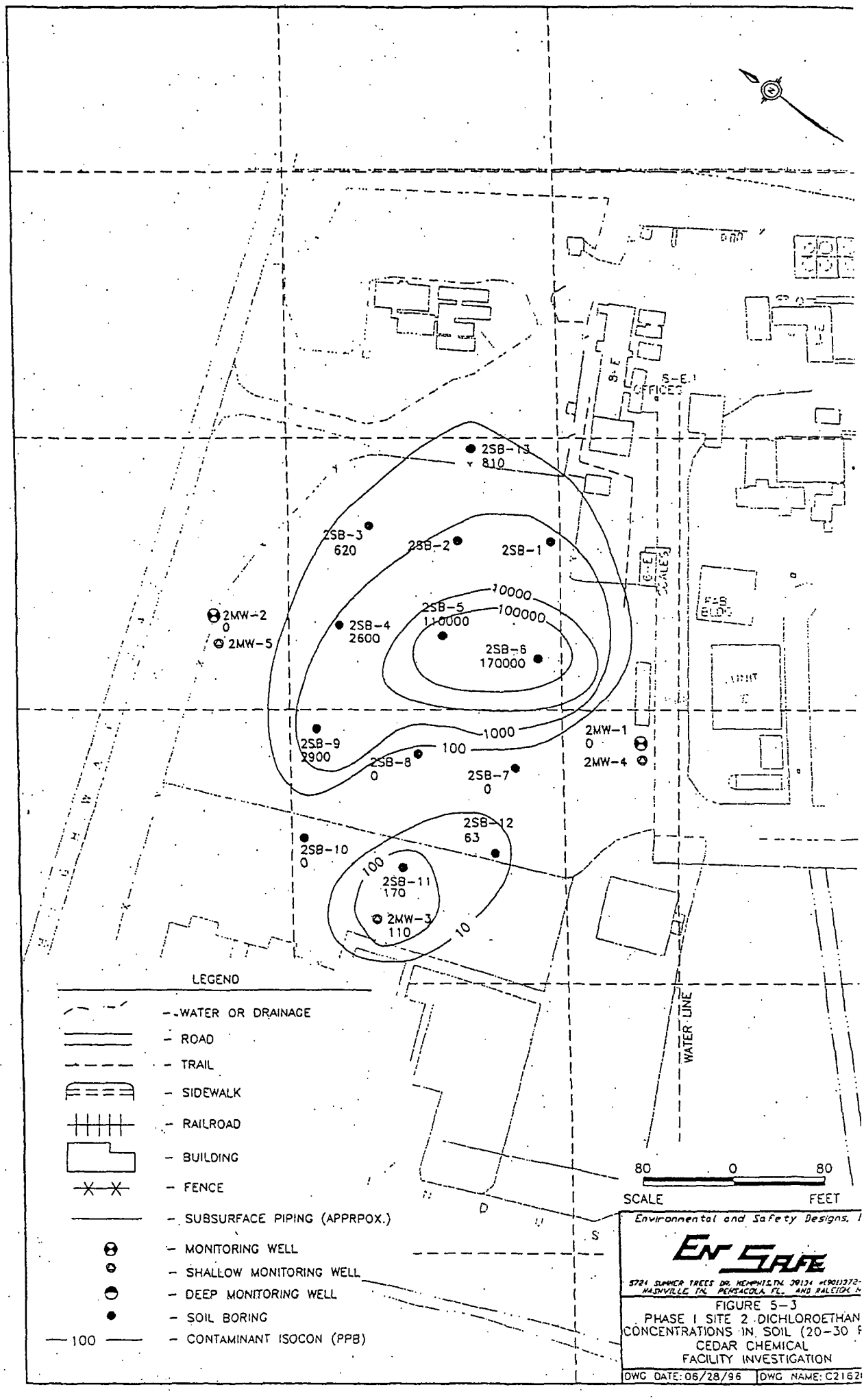
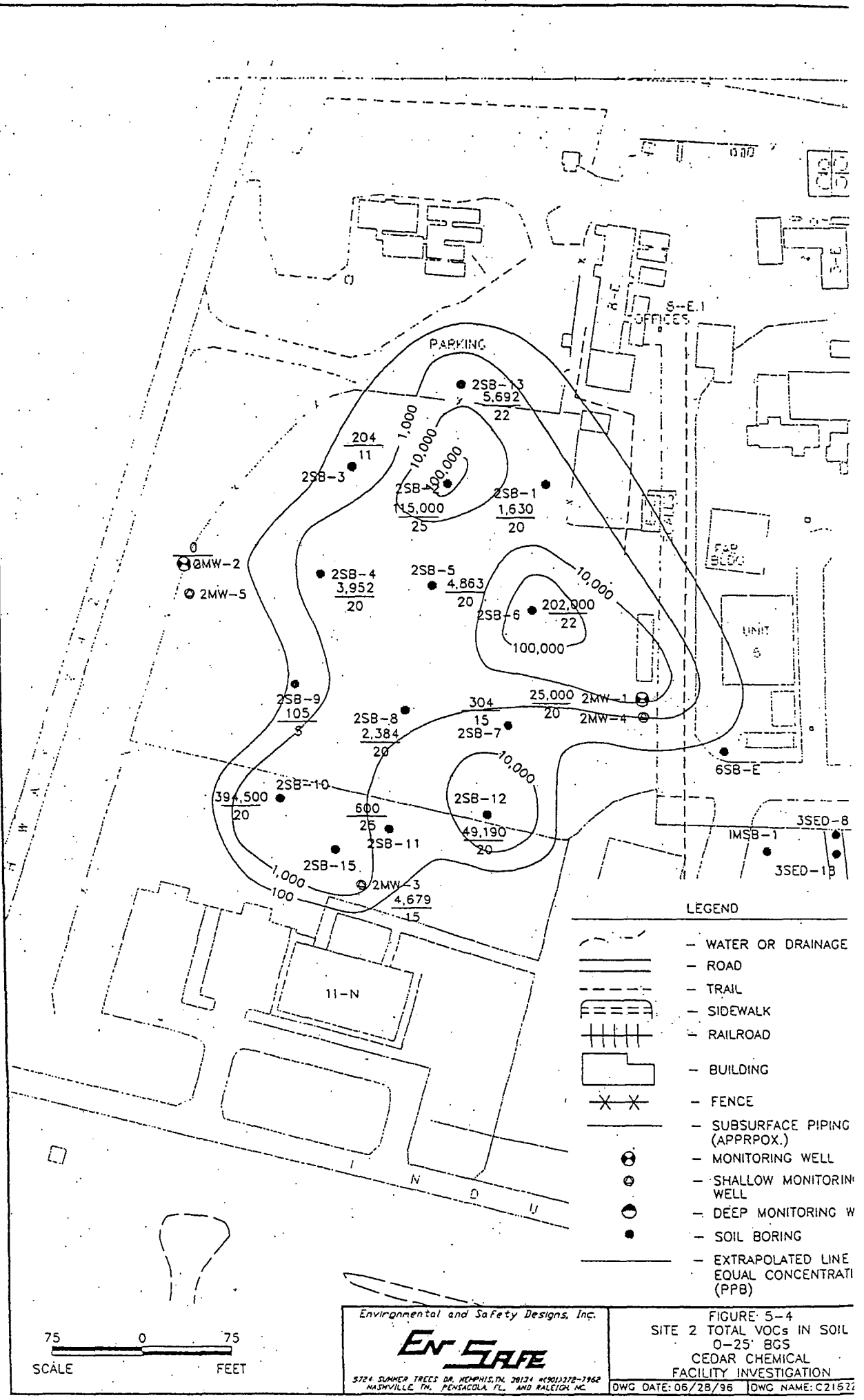
2SB-3
8100
2SB-2
40000
2SB-1
110000
2MW-2
0
2MW-5
2SB-4
100000
2SB-5
380000
2SB-6
170000
100000
2SB-9
93000
2SB-8
2SB-7
2MW-1
25000
2MW-4
10000
2SB-12
45000
2SB-10
370
2SB-11
340
1000
2MW-3
890
8-E
3-E
6-E
SCALES
OFFICES
WATER LINE
LEGEND
– WATER OR DRAINAGE
– ROAD
– TRAIL
– SIDEWALK
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPING (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITORING WELL
– DEEP MONITORING WELL
– SOIL BORING
100 – CONTAMINANT ISOCON (PPB)
80 0 80
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS, TN 38134 (901)372-796
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.
FIGURE 5-2
PHASE I SITE 2 METHYLENE CHLORID
CONCENTRATIONS IN SOIL (20-30 FEE
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE: 06/28/96
DWG NAME: C2162ST2


2SB-13
810
2SB-3
620
2SB-2
2SB-1
2MW-2
0
2MW-5
2SB-4
2600
2SB-5
110000
10000
100000
2SB-6
170000
2SB-9
2900
1000
100
2SB-8
0
2SB-7
0
2MW-1
0
2MW-4
2SB-12
63
2SB-10
0
100
2SB-11
170
2MW-3
110
10
OFFICES
WATER LINE
LEGEND
WATER OR DRAINAGE
ROAD
TRAIL
SIDEWALK
RAILROAD
BUILDING
FENCE
SUBSURFACE PIPING (APPRPOX.)
MONITORING WELL
SHALLOW MONITORING WELL
DEEP MONITORING WELL
SOIL BORING
100
CONTAMINANT ISOCON (PPB)
80 0 80
SCALE FEET
Environmental and Safety Designs, I
EnSafe
5724 SUMMER TREES DR, MEMPHIS, TN 38134 (901)372-
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, N
FIGURE 5-3
PHASE I SITE 2 DICHLOROETHAN
CONCENTRATIONS IN SOIL (20-30 F
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE: 06/28/96
DWG NAME: C2162



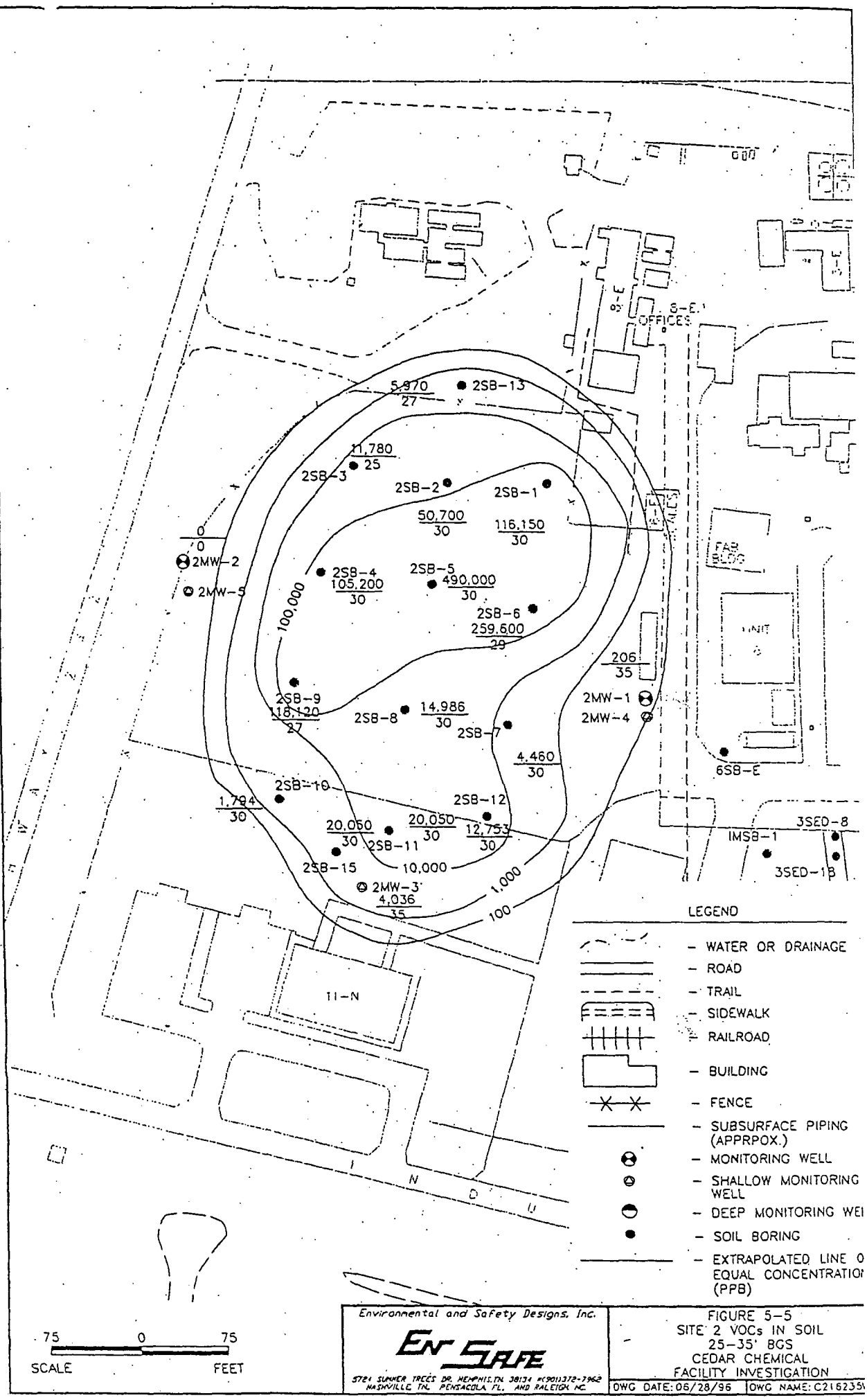
Environmental and Safety Designs, Inc.

EnSafe

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 (901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.

FIGURE 5-4
SITE 2 TOTAL VOCs IN SOIL
0-25' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 06/28/96 | DWG NAME: C21572



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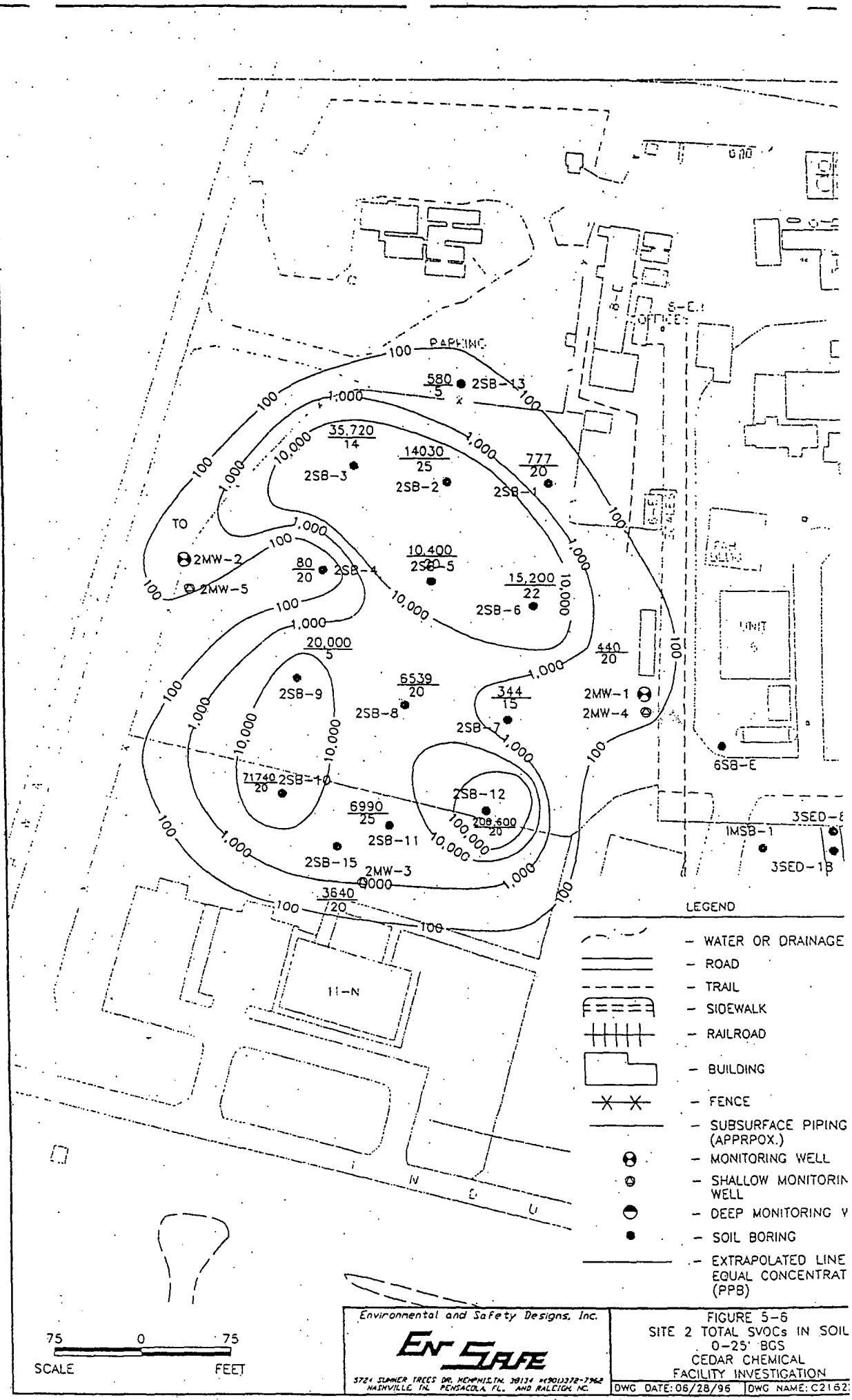
5781 SUMMER TREES DR. MEMPHIS, TN 38134 #(901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.

FIGURE 5-5
SITE 2 VOCs IN SOIL
25-35' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 05/28/96 | DWG NAME: C216235\



Environmental and Safety Designs, Inc.

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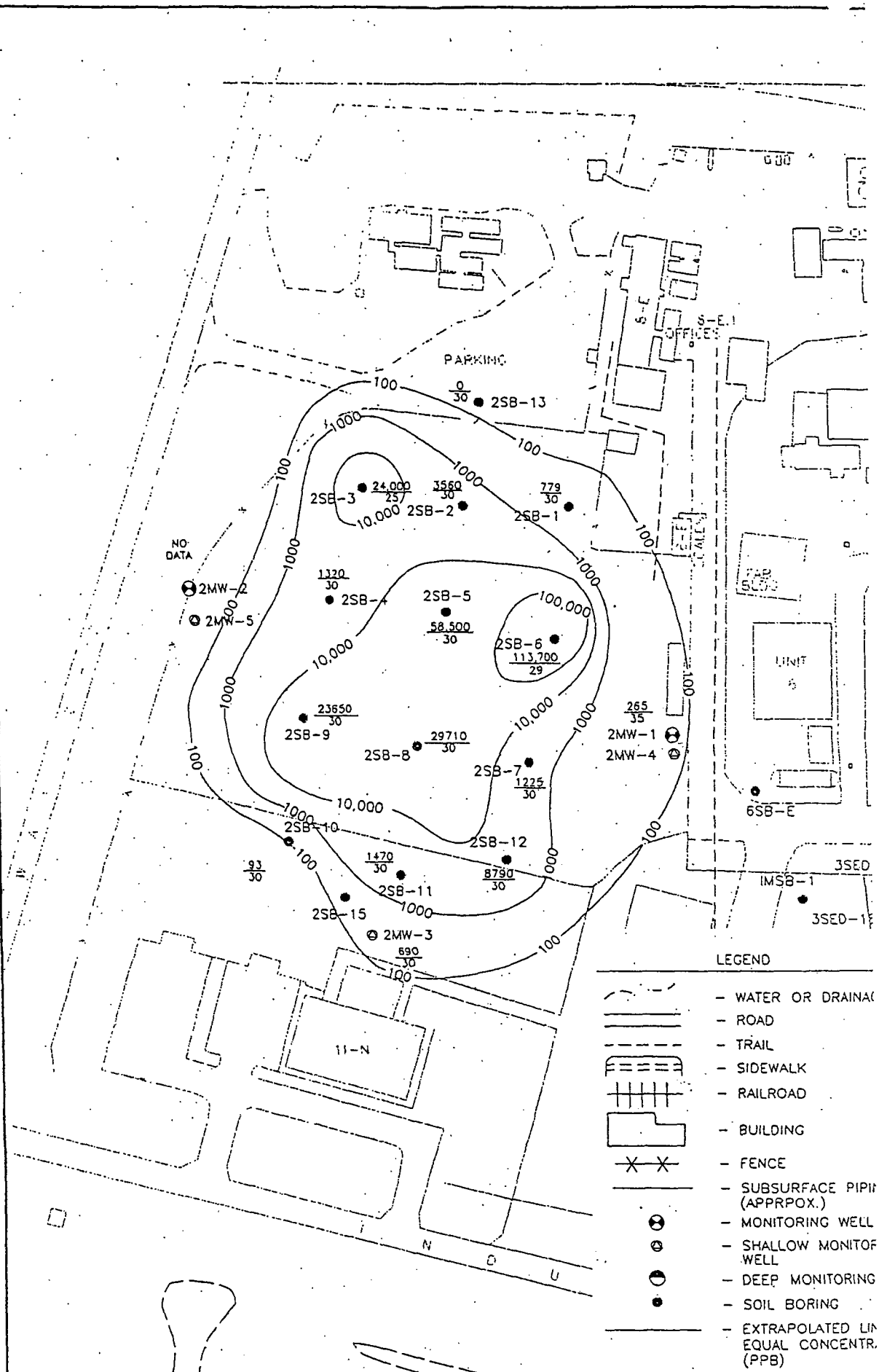
5724 SUMMER TREES DR. MEMPHIS, TN. 38134 ★(901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.

FIGURE 5-6
SITE 2 TOTAL SVOCs IN SOIL
0-25' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 06/28/96 | DWG NAME: C2162


PARKING
OFFICES
S-E.1
NO DATA
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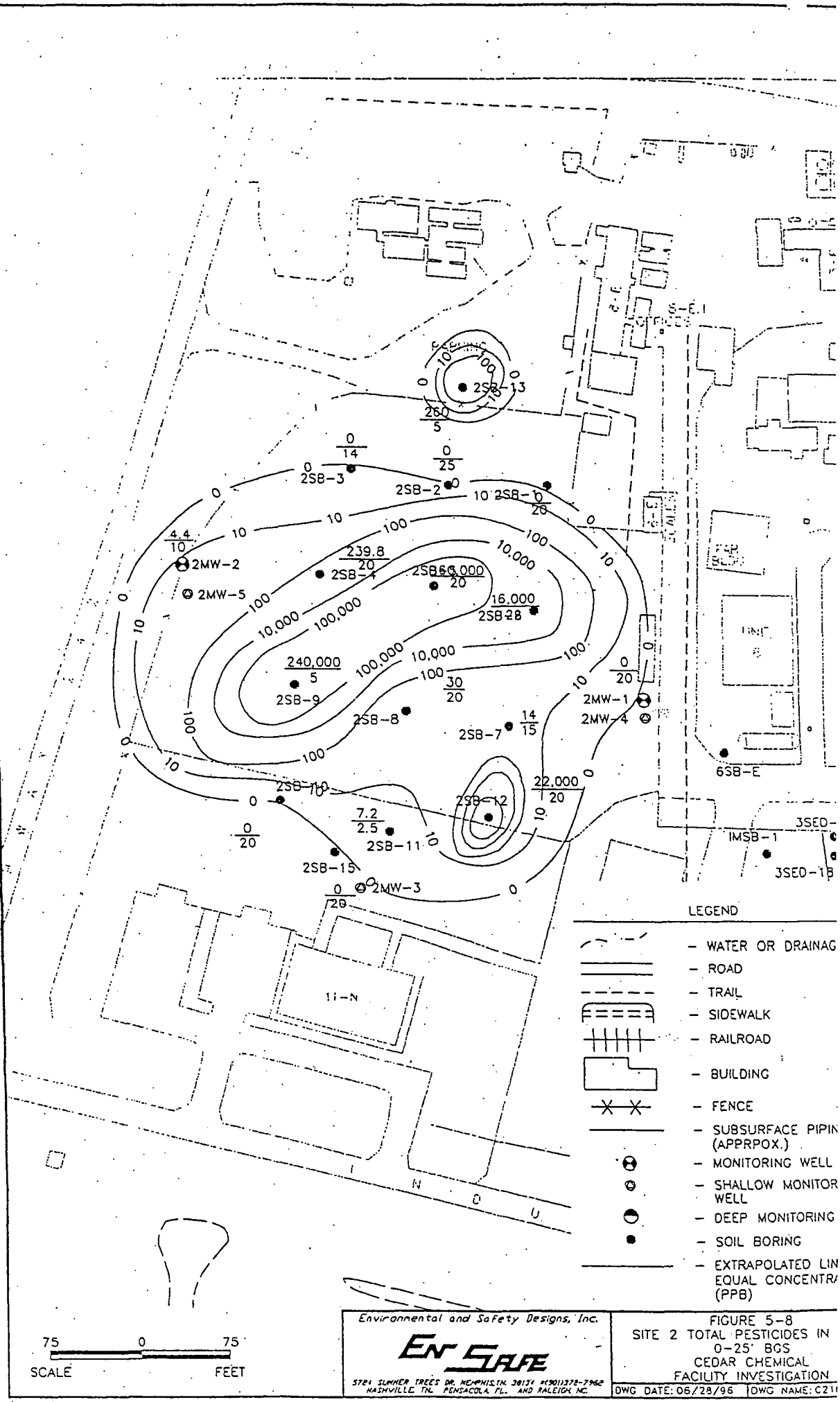
2SB-3
2SB-2
2SB-1
2SB-4
2SB-5
2SB-6
2SB-9
2SB-8
2SB-7
2SB-10
2SB-12
2SB-11
2SB-15
2MW-1
2MW-2
2MW-3
2MW-4
2MW-5
6SB-E
IMSB-1
3SED-1
UNIT
11-N
100
1000
10,000
100,000
LEGEND
– WATER OR DRAINA
– ROAD
– TRAIL
– SIDEWALK
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPI (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITOF WELL
– DEEP MONITORING
– SOIL BORING
– EXTRAPOLATED LI EQUAL CONCENTR. (PPB)
75 0 75
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS, TN 38134 (901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.
FIGURE 5-7
SITE 2 TOTAL SVOCs IN SC
25-30' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE: 06/28/96
DWG NAME: C21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0
14
2SB-3
0
25
2SB-2
10
2SB-1
20
4.4
10
2MW-2
239.8
20
2SB-4
2SB-6
20
2MW-5
16,000
2SB-8
240,000
5
2SB-9
30
20
2SB-8
2SB-7
14
15
0
20
2MW-1
2MW-4
6SB-E
22,000
20
2SB-12
2SB-10
7.2
2.5
2SB-11
0
20
2SB-15
0
20
2MW-3
3SED-
IMSB-1
3SED-1
LEGEND
– WATER OR DRAINAG
– ROAD
– TRAIL
– SIDEWALK
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPIN (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITOR WELL
– DEEP MONITORING
– SOIL BORING
– EXTRAPOLATED LIN EQUAL CONCENTRA (PPB)
75
0
75
SCALE
FEET
Environmental and Safety Designs, Inc.
EN SAFE
5724 SUMMER TREES DR. MEMPHIS TN 38134 (901)373-7962
NASHVILLE TN. PENSACOLA FL. AND RALEIGH NC.
FIGURE 5-8
SITE 2 TOTAL PESTICIDES IN 0-25' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE: 06/28/96
DWG NAME: C21

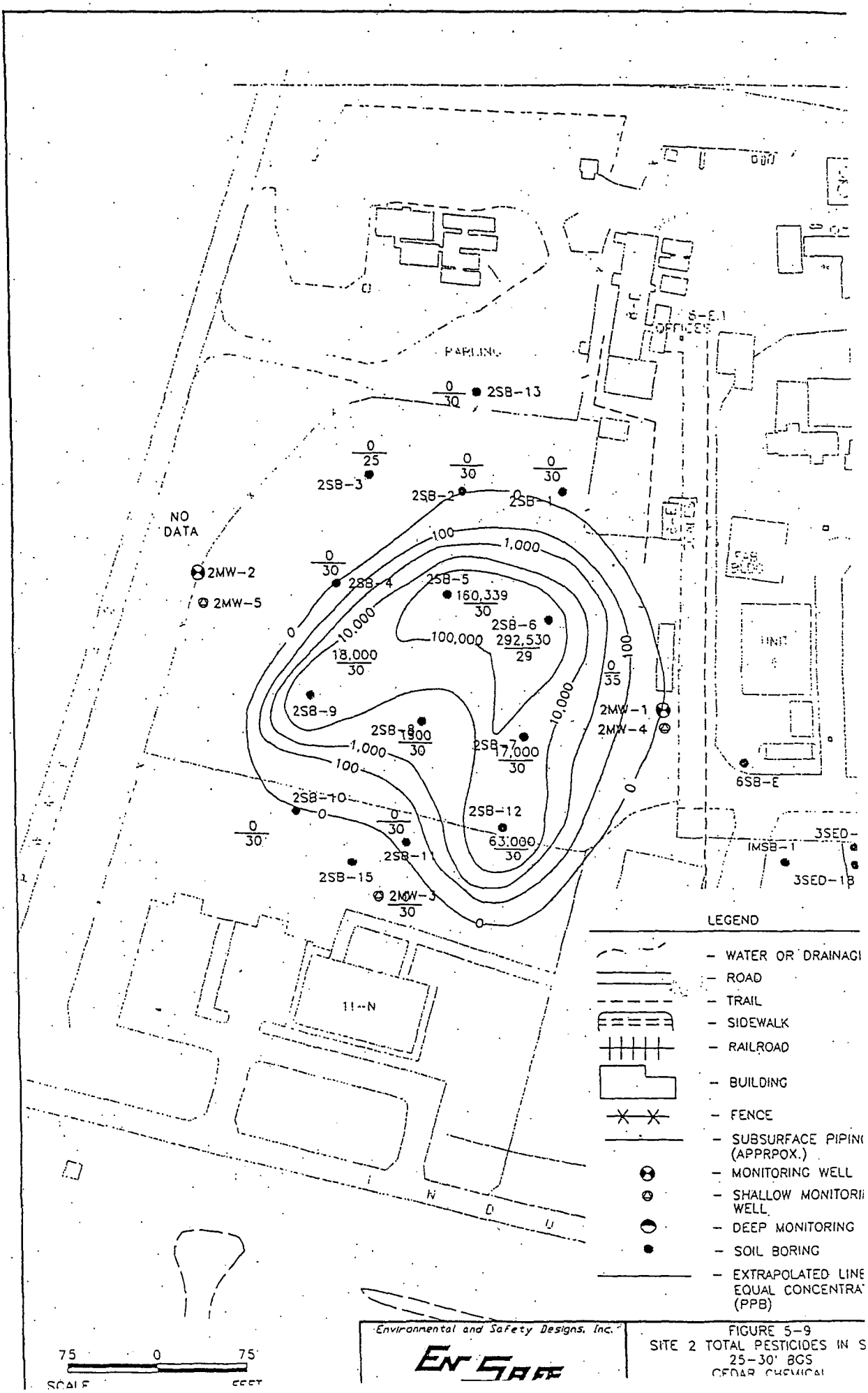
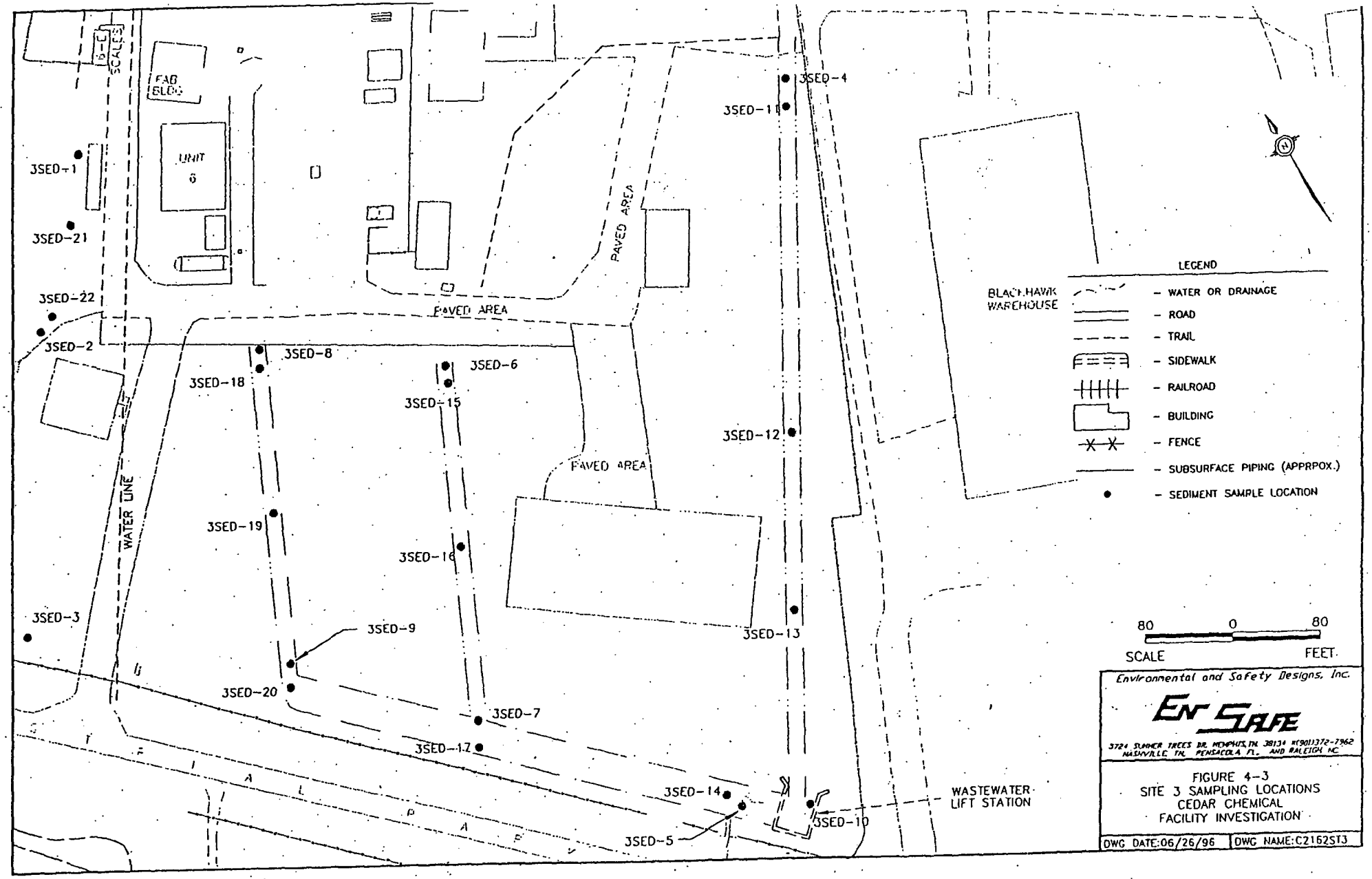


FIGURE 5-9
SITE 2 TOTAL PESTICIDES IN S
25-30' BGS
CEDAR CHEMICAL

Cedar Chemical Co.
Perched Aquifer EDC Data - ug/L
Onsite Wells

Location	EDC		3,4-Dichloroaniline		4-Chloroaniline		Methylene Chloride	
	Apr-01	July-01	Apr-01	July-01	Apr-01	July-01	Apr-01	July-01
1MW-1	1< U	0.2 J	<10 U	<10 U	<10 U	<10 U	<2 U	3
1MW-2	1< U	0.8 J	<10 U	<10 U	<10 U	<10 U	<2 U	2
1MW-3	3	10	<10 U	<10 U	<10 U	<10 U	<2 U	5
1MW-4	540	110 D	<10 U	<10 U	<10 U	<10 U	<50 U	4
1MW-5	<1 U	<1 U	<10 U	<10 U	<10 U	<10 U	<2 U	4
2MW-2	<2 U	0.9 J	240	17	<10 U	<10 U	<5 U	3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FAB BLDG
UNIT 6
PAVED AREA
PAVED AREA
PAVED AREA
BLACKHAWK WAREHOUSE
WATER LINE
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3SED-21
3SED-22
3SED-2
3SED-3
3SED-18
3SED-8
3SED-6
3SED-15
3SED-19
3SED-16
3SED-9
3SED-20
3SED-7
3SED-17
3SED-14
3SED-5
3SED-10
3SED-13
3SED-12
3SED-11
3SED-4
TRAILPARK
WASTEWATER LIFT STATION
LEGEND
- WATER OR DRAINAGE
- ROAD
- TRAIL
- SIDEWALK
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- SEDIMENT SAMPLE LOCATION
80 0 80
SCALE FEET.
Environmental and Safety Designs, Inc.
EnSafe
3724 SUMMER TREES DR. MEMPHIS, TN 38134 (901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.
FIGURE 4-3
SITE 3 SAMPLING LOCATIONS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/26/96
DWG NAME:C2162ST3

Table 5-7
Cedar Chemical
Phase I Facility Investigation
Site 3 Sediment Data

Compound	3SED-1	3SED-2	3SED-3	3SED-4	3SED-5
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	7
1,2-Dichloroethane	U	U	U	U	U
Chlorobenzene	U	34	11	U	U
Total Xylenes	U	U	U	U	44
Acetone	U	U	130	U	U
Methylene Chloride	U	U	U	U	2
Semivolatiles (ppb)					
4-Nitrophenol	350	U	U	U	U
4-Chloroaniline	U	190	500	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	230	92	U	U
Propanil	U	110	44	U	U
Di-n-butylphthalate	U	U	U	U	U
Pentachlorophenol	5,300	200	U	U	U
Dinoseb	U	U	U	U	U
Naphthalene	U	U	U	U	86
2-Methylnaphthalene	U	U	U	U	550
1,2-Dichlorobenzene	U	U	300	U	120
3,4-Dichloroaniline	U	2,800	1,300	440	100,000
Pesticides (ppb)					
Aldrin	U	U	354	U	U
4,4'-DDT	U	U	8	U	U
Endrin Ketone	U	U	U	U	U
Dieldrin	U	12	3,400	3	57
Methoxychlor	3,600	260	2,400	U	U
44'-DDD	U	39		U	U
4,4'-DDE	U	7	U	8	U
Metals (ppm)					
Lead	7	14	10	9	10
Arsenic	7	7	5	4	7
Barium	114	138	96	87	114
Chromium	10	17	16	12	11

Notes:
U Not detected above PQLs

Table 5-7
Cedar Chemical
Phase I Facility Investigation
Site 3 Sediment Data

Compound	3SED-6	3SED-7	3SED-8	3SED-9	3SED-10
Volatiles (ppb)	U	U	U	U	U
Ethylbenzene	U	U	U	U	2
1,2-Dichloroethane	U	U	U	U	43
Chlorobenzene	U	U	U	U	U
Total Xylenes	U	U	U	U	12
Acetone	U	U	U	U	U
Methylene Chloride	U	U	U	U	160
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	U	U	U	U	U
Di-n-octylphthalate	U	U	180	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Pentachlorophenol	U	U	U	U	U
Dinoseb	U	4,000	U	U	U
Naphthalene	U	U	U	U	U
2-Methylnaphthalene	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	400	370	840	310	U
Pesticides (ppb)					
Aldrin	U	U	U	U	
4,4'-DDT	U	U	U	U	12
Endrin Ketone	U	U	U	U	19
Dieldrin	86	200	34	5	U
Methoxychlor	740	890	1,300	U	U
44'-DDD	U	U	U	U	29
4,4'-DDE	U	U	U	U	26
Metals (ppm)					
Lead	12	12	8	11	11
Arsenic	13	7	9	222	4
Barium	123	143	112	150	215
Chromium	19	16	10	12	8

Notes:
U Not detected above PQLs

Table 5-8
Cedar Chemical
Phase II Facility Investigation
Site 3 - Sediment Data

	Compounds Detected										
	Pesticides (ppb)									Semivolatiles (ppb)	Metals (ppm)
Sample	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Methoxychlor	delta-BHC	Endrin	Toxaphene	Dinoseb	Arsenic
3SED-1-S	U	5	15	U	U	U	U	U	U	U	U
3SED-1-N	U	U	U	U	U	U	U	U	U	U	U
3SED-2-S	U	U	U	U	U	630	U	U	U	U	U
3SED-2-N	U	U	U	U	U	U	U	U	U	U	U
3SED-3-S	76	U	U	U	U	380	U	U	U	U	U
3SED-3-N	8	U	U	8	2	U	U	U	U	U	U
3SED-4-S	U	U	U	U	6	U	U	U	U	U	U
3SED-4-N	U	U	U	U	U	U	U	U	U	U	U
3SED-5-S	U	U	U	U	U	2,400	U	U	U	U	U
3SED-5-N	U	U	U	U	U	U	U	U	U	U	U
3SED-6-S	27	U	U	U	U	410	U	U	U	U	U
3SED-6-N	38	16	U	U	U	360	U	U	U	U	U
3SED-7-S	21	U	U	3	U	2,500	U	U	U	U	U
3SED-7-N	68	33	U	U	U	320	U	U	U	U	U
3SED-8-S	U	U	U	U	U	1,900	U	U	U	U	U
3SED-8-N	U	U	U	U	U	U	U	U	U	U	U
3SED-9-S	U	U	U	U	U	130	U	U	U	U	U
3SED-9-N	U	U	U	U	U	210	U	U	U	U	U
3SED-10-S	36	U	U	27	220	2,000	U	U	U	U	U
3SED-10-S (dup)	180	78	U	58	550	1,200	U	U	U	U	U
3SED-10-N	170	72	U	U	11	U	18	U	U	U	U
3SED-11-S	U	U	91	U	U	1,700	U	76	1,600	U	20
3SED-11-N	U	U	U	U	43	220	U	89	U	U	U
3SED-12-S	U	U	U	U	U	750	U	U	U	U	U
3SED-12-N	U	U	U	U	U	210	U	U	U	13,000,000	U
3SB-6 (4-8')	U	U	U	U	U	U	U	U	U	180,000	U
3SB-6 (8-12')	U	U	U	U	U	U	U	U	U	560,000	U
3SB-6 (12-14')	U	U	U	U	U	U	U	U	U		

Note:

U Not quantified above PQLs

Table 5-9
Cedar Chemical
Phase III Facility Investigation
Site 3 Soil Data

Compound	3SB-1 (4-6')	3SB-1 (6-8')
Semivolatiles (ppb)		
Dinoseb	180,000	630

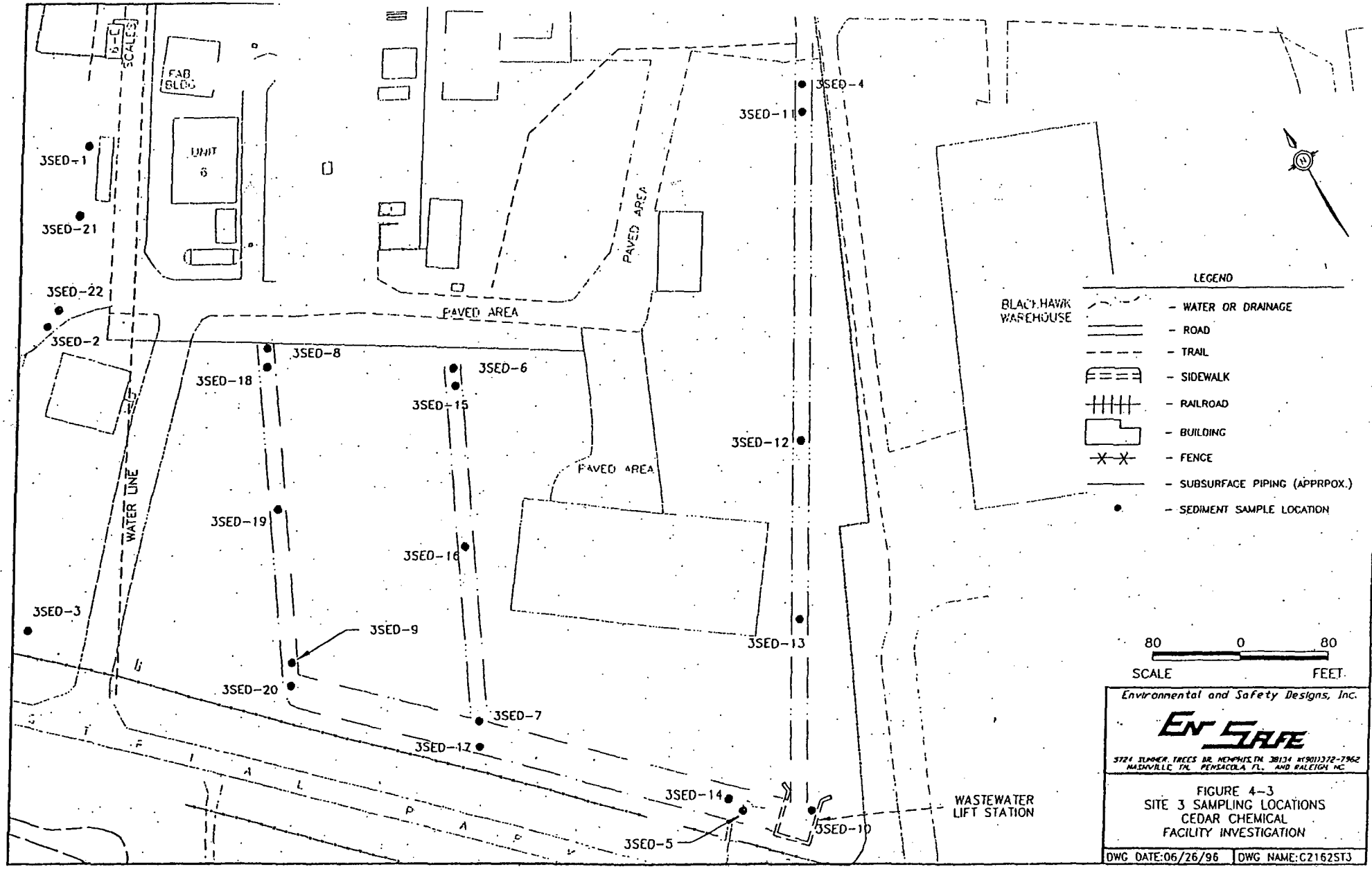
3SED-1
3SED-21
3SED-22
3SED-2
3SED-3
3SED-4
3SED-11
3SED-8
3SED-18
3SED-6
3SED-15
3SED-12
3SED-19
3SED-16
3SED-9
3SED-13
3SED-20
3SED-7
3SED-17
3SED-14
3SED-5
3SED-10
FAB BLDG
UNIT 6
SCALES
PAVED AREA
PAVED AREA
PAVED AREA
WATER LINE
BLACKHAWK WAREHOUSE
WASTEWATER LIFT STATION
FIELD PARCEL
LEGEND
- WATER OR DRAINAGE
- ROAD
- TRAIL
- SIDEWALK
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- SEDIMENT SAMPLE LOCATION
80 0 80
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS, TN 38134 (901) 372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.
FIGURE 4-3
SITE 3 SAMPLING LOCATIONS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/26/96
DWG NAME:C2162ST3

Table 5-7
Cedar Chemical
Phase I Facility Investigation
Site 3 Sediment Data

Compound	3SED-1	3SED-2	3SED-3	3SED-4	3SED-5
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	7
1,2-Dichloroethane	U	U	U	U	U
Chlorobenzene	U	34	11	U	U
Total Xylenes	U	U	U	U	44
Acetone	U	U	130	U	U
Methylene Chloride	U	U	U	U	2
Semivolatiles (ppb)					
4-Nitrophenol	350	U	U	U	U
4-Chloroaniline	U	190	500	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	230	92	U	U
Propanil	U	110	44	U	U
Di-n-butylphthalate	U	U	U	U	U
Pentachlorophenol	5,300	200	U	U	U
Dinoseb	U	U	U	U	U
Naphthalene	U	U	U	U	86
2-Methylnaphthalene	U	U	U	U	550
1,2-Dichlorobenzene	U	U	300	U	120
3,4-Dichloroaniline	U	2,800	1,300	440	100,000
Pesticides (ppb)					
Aldrin	U	U	354	U	U
4,4'-DDT	U	U	8	U	U
Endrin Ketone	U	U	U	U	U
Dieldrin	U	12	3,400	3	57
Methoxychlor	3,600	260	2,400	U	U
44'-DDD	U	39		U	U
4,4'-DDE	U	7	U	8	U
Metals (ppm)					
Lead	7	14	10	9	10
Arsenic	7	7	5	4	7
Barium	114	138	96	87	114
Chromium	10	17	16	12	11

Notes:
U Not detected above PQLs

Table 5-7
Cedar Chemical
Phase I Facility Investigation
Site 3 Sediment Data

Compound	3SED-6	3SED-7	3SED-8	3SED-9	3SED-10
Volatiles (ppb)	U	U	U	U	U
Ethylbenzene	U	U	U	U	2
1,2-Dichloroethane	U	U	U	U	43
Chlorobenzene	U	U	U	U	U
Total Xylenes	U	U	U	U	12
Acetone	U	U	U	U	U
Methylene Chloride	U	U	U	U	160
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	U	U	U	U	U
Di-n-octylphthalate	U	U	180	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Propanil	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Pentachlorophenol	U	U	U	U	U
Dinoseb	U	4,000	U	U	U
Naphthalene	U	U	U	U	U
2-Methylnaphthalene	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	400	370	840	310	U
Pesticides (ppb)					
Aldrin	U	U	U	U	
4,4'-DDT	U	U	U	U	12
Endrin Ketone	U	U	U	U	19
Dieldrin	86	200	34	5	U
Methoxychlor	740	890	1,300	U	U
44'-DDD	U	U	U	U	29
4,4'-DDE	U	U	U	U	26
Metals (ppm)					
Lead	12	12	8	11	11
Arsenic	13	7	9	222	4
Barium	123	143	112	150	215
Chromium	19	16	10	12	8

Notes:
U Not detected above PQLs

Table 5-8
Cedar Chemical
Phase II Facility Investigation
Site 3 - Sediment Data

Compounds Detected

Sample	Pesticides (ppb) 4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Methoxychlor	delta-BHC	Endrin	Toxaphene	Semivolatiles (ppb) Dinoseb	Metals (ppm) Arsenic
3SED-1-S	U	5	15	U	U	U	U	U	U	U	U
3SED-1-N	U	U	U	U	U	U	U	U	U	U	U
3SED-2-S	U	U	U	U	U	630	U	U	U	U	U
3SED-2-N	U	U	U	U	U	U	U	U	U	U	U
3SED-3-S	76	U	U	U	U	380	U	U	U	U	U
3SED-3-N	8	U	U	8	2	U	U	U	U	U	U
3SED-4-S	U	U	U	U	6	U	U	U	U	U	U
3SED-4-N	U	U	U	U	U	U	U	U	U	U	U
3SED-5-S	U	U	U	U	U	2,400	U	U	U	U	U
3SED-5-N	U	U	U	U	U	U	U	U	U	U	U
3SED-6-S	27	U	U	U	U	410	U	U	U	U	U
3SED-6-N	38	16	U	U	U	360	U	U	U	U	U
3SED-7-S	21	U	U	3	U	2,500	U	U	U	U	U
3SED-7-N	68	33	U	U	U	320	U	U	U	U	U
3SED-8-S	U	U	U	U	U	1,900	U	U	U	U	U
3SED-8-N	U	U	U	U	U	U	U	U	U	U	U
3SED-9-S	U	U	U	U	U	130	U	U	U	U	U
3SED-9-N	U	U	U	U	U	210	U	U	U	U	U
3SED-10-S	36	U	U	27	220	2,000	U	U	U	U	U
3SED-10-S (dup)	180	78	U	58	550	1,200	U	U	U	U	U
3SED-10-N	170	72	U	U	11	U	18	U	U	U	U
3SED-11-S	U	U	91	U	U	1,700	U	76	1,600	U	20
3SED-11-N	U	U	U	U	43	220	U	89	U	U	U
3SED-12-S	U	U	U	U	U	750	U	U	U	U	U
3SED-12-N	U	U	U	U	U	210	U	U	U	13,000,000	U
3SB-6 (4-8')	U	U	U	U	U	U	U	U	U	180,000	U
3SB-6 (8-12')	U	U	U	U	U	U	U	U	U	560,000	U
3SB-6 (12-14')	U	U	U	U	U	U	U	U	U		

Note:
U Not quantified above PQLs

Table 5-9
Cedar Chemical
Phase III Facility Investigation
Site 3 Soil Data

Compound	3SB-1 (4-6')	3SB-1 (6-8')
Semivolatiles (ppb)		
Dinoseb	/180,000	630

Table 5-10
Cedar Chemical
Phase I Facility Investigation
Site 4 Soil Data

Compound	4HA-1 (0-1')	4HA-1 (1-2')	4HA-1 (2-3')	4HA-2 (0-1')	4HA-2 (1-2')
Volatiles (ppb)					
Ethylbenzene	U	U	U	4	150
1,2-Dichloroethane	U	U	U	U	U
4-Methyl-2-Pentanone	U	U	U	U	U
Toluene	U	U	U	8	500
Chlorobenzene	U	U	U	U	7
Total Xylenes	U	U	U	U	340
Acetone	U	U	U	19	U
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	120
1,1-Dichloroethene	U	U	U	U	U
2-Butanone	U	U	U	17	43
Trichloroethene	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	U	U	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Pyrene	U	U	U	U	U
Dimethylphthalate	U	U	U	U	U
Fluoranthene	U	U	U	U	U
Propanil	U	U	410	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	2,700
Dinoseb	U	U	740	500,000	1,100,000
2-Methyphenol	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	1,900	4,900	U	7,400
Pesticides (ppb)					
Heptachlor Epoxide	U	U	U	U	U
Endosulfan Sulfate	U	U	U	U	U
Aldrin	U	U	U	U	U
alpha-BHC	U	8	U	U	U
beta-BHC	U	U	5	U	U
delta-BHC	U	U	U	U	U
Endosulfan II	U	U	U	U	72
4,4'-DDT	U	U	19	260	430
alpha-Chlordan	U	U	U	U	U
gamma-Chlordane	U	U	U	U	U
Endrin Ketone	U	U	U	U	770
Lindane	U	U	U	U	U
Dieldrin	U	U	50	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	8,100	5,700	15,000	74,000
4,4'-DDD	U	33	84	U	120
4,4'-DDE	7	25	37	56	150
Heptachlor	U	U	U	U	U
Toxaphene	U	U	U	U	U
Endosulfan I	U	U	U	U	U
Metals (ppm)					
Lead	6	7	7	8	9
Arsenic	5	5	3	4	4
Silver	U	U	U	U	U
Barium	101	73	111	94	91
Cadmium	U	U	U	U	U
Chromium	12	11	12	14	14
Mercury	U	U	U	U	U

Notes:
U Not detected above PQLs

Table 5-10
Cedar Chemical
Phase I Facility Investigation
Site 4 Soil Data

Compound	4HA-2 (2-3')	4HA-3 (0-1')	4HA-4 (0-1')	4HA-4 (1-2')	4HA-4 (2-3')
Volatiles (ppb)					
Ethylbenzene	110	U	U	U	U
1,2-Dichloroethane	U	U	U	25	320
4-Methyl-2-Pentanone	U	U	U	U	U
Toluene	290	U	U	45	220
Chlorobenzene	U	U	U	U	U
Total Xylenes	270	U	U	U	1
Acetone	U	U	170	31	20
Chloroform	U	U	U	U	25
Benzene	U	U	U	U	U
Methylene Chloride	U	U	U	1	3
Carbon Disulfide	68	U	U	U	16
1,1-Dichloroethene	U	U	U	U	2
2-Butanone	U	9	12	17	19
Trichloroethene	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	U	U	U	12,000	4,500
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	470	U
Pyrene	U	U	U	110	U
Dimethylphthalate	U	U	94	U	U
Fluoranthene	U	U	U	130	U
Propanil	U	U	U	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Dinoseb	470,000	U	U	U	U
2-Methyphenol	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	160	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Heptachlor Epoxide	U	U	U	U	U
Endosulfan Sulfate	U	U	U	U	U
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
delta-BHC	U	U	U	U	U
Endosulfan II	U	U	3	U	U
4,4'-DDT	170	U	U	U	U
alpha-Chlordan	U	U	U	U	U
gamma-Chlordane	U	U	U	U	U
Endrin Ketone	U	U	U	U	U
Lindane	U	U	U	U	U
Dieldrin	U	U	2	U	U
Endrin	U	U	U	U	U
Methoxychlor	15,000	8,400	12,000	26,000	1,600
4,4'-DDD	U	U	U	U	U
4,4'-DDE	75	5	25	280	U
Heptachlor	U	U	U	U	U
Toxaphene	U	U	U	U	U
Endosulfan I	U	U	U	U	U
Metals (ppm)					
Lead	8	4	6	9	9
Arsenic	4	3	4	7	8
Silver	U	U	U	U	U
Barium	87	54	53	81	97
Cadmium	U	0	0	U	U
Chromium	14	11	10	9	11
Mercury	U	U	U	U	U

Notes:
U Not detected above PQLs

Table 5-10
Cedar Chemical
Phase I Facility Investigation
Site 4 Soil Data

Compound	4HA-5 (0-1')	4HA-5 (1-2')	4HA-5 (2-3')	4HA-6 (0-1')	4HA-6 (1-2')
Volatiles (ppb)					
Ethylbenzene	7	U	110	U	8
1,2-Dichloroethane	U	U	U	U	U
4-Methyl-2-Pentanone	19	32	120	U	28
Toluene	350	830	10,000	5	100
Chlorobenzene	3	U	35	U	3
Total Xylenes	76	71	4,400	36	290
Acetone	25	U	110	U	130
Chloroform	U	U	U	U	U
Benzene	U	U	2	U	U
Methylene Chloride	U	U	5	U	U
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U
2-Butanone	U	U	28	U	54
Trichloroethene	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	8,600	9,100	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	1,200	1,300	U	U	U
Di-n-octylphthalate	U	4,300	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Pyrene	U	U	U	U	U
Dimethylphthalate	U	U	U	U	U
Fluoranthene	U	U	U	U	U
Propanil	690	49,000	130,000	2,500	U
Isophorone	U	730	U	U	U
Di-n-butylphthalate	540	460	U	400	U
Dinoseb	1,400	30,000	920,000	190,000	U
2-Methyphenol	U	U	U	U	U
1,2-Dichlorobenzene	1,500	1,700	U	3,700	U
3,4-Dichloroaniline	85,000	2,500,000	400,000	U	12,000,000
Pesticides (ppb)					
Heptachlor Epoxide	U	U	U	U	U
Endosulfan Sulfate	U	U	U	U	U
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	14	U
beta-BHC	U	U	38	U	U
delta-BHC	U	U	U	U	U
Endosulfan II	U	U	U	U	U
4,4'-DDT	U	U	U	100	450
alpha-Chlordan	U	U	U	U	U
gamma-Chlordane	U	U	U	U	U
Endrin Ketone	U	U	U	U	U
Lindane	U	U	U	U	U
Dieldrin	U	U	U	190	630
Endrin	U	U	U	U	U
Methoxychlor	3,200	7,400	U	9,400	34,000
4,4'-DDD	44	U	NR	33	140
4,4'-DDE	19	U	19	36	110
Heptachlor	12	U	U	U	U
Toxaphene	U	U	U	U	U
Endosulfan I	U	U	U	32	U
Metals (ppm)					
Lead	13	9	7	10	16
Arsenic	5	4	3	4	5
Silver	U	U	U	U	U
Barium	75	94	113	76	84
Cadmium	U	U	U	0	U
Chromium	19	18	14	14	21
Mercury	U	U	U	U	U

Notes:
U Not detected above PQLs

Table 5-10
Cedar Chemical
Phase I Facility Investigation
Site 4 Soil Data

Compound	4HA-7 (5-6')	4HA-7 (6-7')	4HA-7 (7-8')	4HA-8 (5-6')	4HA-8 (6-7')
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	U
1,2-Dichloroethane	U	31	26	U	U
4-Methyl-2-Pentanone	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	U	U
Total Xylenes	U	U	U	U	U
Acetone	U	12	12	U	U
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U
2-Butanone	U	U	U	U	U
Trichloroethene	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
4-Chloroaniline	U	U	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Pyrene	U	U	U	U	U
Dimethylphthalate	180	U	U	U	U
Fluoranthene	U	U	U	U	U
Propanil	U	U	U	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Dinoseb	840,000	98,000	19,000	91,000	73,000
2-Methyphenol	U	U	U	U	U
1,2-Dichlorobenzene	120	U	U	U	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Heptachlor Epoxide	U	U	U	U	U
Endosulfan Sulfate	U	U	U	U	U
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
delta-BHC	U	U	U	U	U
Endosulfan II	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
alpha-Chlordan	U	U	U	U	U
gamma-Chlordane	U	U	U	U	U
Endrin Ketone	U	U	U	U	U
Lindane	U	U	U	U	U
Dieldrin	U	U	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	U	U	U	U
4,4'-DDD	U	U	U	U	U
4,4'-DDE	U	U	U	U	U
Heptachlor	U	U	U	U	U
Toxaphene	U	U	U	U	U
Endosulfan I	U	U	U	U	U
Metals (ppm)					
Lead	11	11	9	11	13
Arsenic	7	7	6	7	8
Silver	U	U	U	U	U
Barium	106	118	127	113	118
Cadmium	U	U	U	U	U
Chromium	18	15	11	18	15
Mercury	U	U	U	U	U

Notes:
U Not detected above PQLs

Table 5-10
Cedar Chemical
Phase I Facility Investigation
Site 4 Soil Data

Compound	4HA-8 (7-8')	4MW-1 (10-15')	MW-2 (25-30')	4MW-2 (0-5')	MW-2 (25-30')
Volatiles (ppb)					
Ethylbenzene	U	9	U	U	U
1,2-Dichloroethane	U	120	650	U	U
4-Methyl-2-Pentanone	U	31	23	U	U
Toluene	U	56,000	670	2	U
Chlorobenzene	U	U	U	U	U
Total Xylenes	U	96	68	U	U
Acetone	U	99	1,200	27	U
Chloroform	U	12	U	U	U
Benzene	U	29	U	U	U
Methylene Chloride	U	130	270	U	9
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethene	U	U	U	U	U
2-Butanone	U	U	U	60	U
Trichloroethene	U	29	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	2	U	U
4-Chloroaniline	U	U	U	U	U
Phenol	U	U	7	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Di-n-octylphthalate	U	U	U	U	U
1,2,4-Trichlorobenzene	U	U	U	U	U
Pyrene	U	U	U	U	U
Dimethylphthalate	170	U	U	U	U
Fluoranthene	U	U	U	U	U
Propanil	U	U	64	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Dinoseb	26,000	6,300	U	18,000	45
2-Methyphenol	U	U	2	U	U
1,2-Dichlorobenzene	U	U	U	U	U
3,4-Dichloroaniline	U	U	12	U	U
Pesticides (ppb)					
Heptachlor Epoxide	U	U	U	U	U
Endosulfan Sulfate	U	U	U	U	U
Aldrin	U	U	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
delta-BHC	U	U	U	U	U
Endosulfan II	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
alpha-Chlordan	U	U	U	U	U
gamma-Chlordane	U	U	U	U	U
Endrin Ketone	U	U	U	U	U
Lindane	U	U	U	U	U
Dieldrin	U	6	U	U	U
Endrin	U	U	U	U	U
Methoxychlor	U	460	U	U	U
4,4'-DDD	U	U	U	U	U
4,4'-DDE	U	U	U	U	U
Heptachlor	U	U	U	U	U
Toxaphene	U	U	U	U	U
Endosulfan I	U	U	U	U	U
Metals (ppm)					
Lead	11	30	11	9	11
Arsenic	7	9	16	6	1
Silver	U	U	U	U	U
Barium	96	218	95	112	109
Cadmium	U	U	U	U	U
Chromium	13	12	15	11	12
Mercury	U	U	U	U	U

Notes:
U Not detected above PQLs

Table 5-11
Cedar Chemical
Phase II Facility Investigation
Site 4 Soil Data

Compounds Detected

	Volatiles (ppb)						Semivolatiles (ppb)		Pesticides (ppb)				
Compound	1,2-Dichloroethane	2-Butanone	Acetone	Ethylbenzene	Toluene	Xylene (total)	Isophorone	Dinoseb	4,4'-DDD	4,4'-DDE	4,4'-DDT	Methoxychlor	Dieldrin
4SB-1 (0-2')	10	130	250	13	32	U	U	550,000	U	U	U	8,700	U
4SB-1 (4-6')	U	U	150	U	28	U	U	360,000	U	U	U	U	U
4SB-1 (8-10')	U	U	4,400	U	U	U	U	U	U	U	U	U	U
4SB-2 (0-2')	U	U	U	U	U	U	U	U	350	250	U	120	U
4SB-2 (12-14')	U	U	U	U	U	U	8,800	U	U	U	U	U	U
4MW-3 (0-3')	U	U	U	U	U	U	U	U	U	22	100	220	U
4MW-3 (28-33')	340	U	U	U	U	U	U	U	U	U	U	U	U
4MW-4 (0-3')	U	U	U	U	8	U	U	95,000	29	23	55	6,800	480
4MW-4 (0-3') *	U	U	U	U	6	U	U	90,000	23	21	44	8,900	430
4MW-4 (8-13')	U	U	190	U	U	U	U	50,000	U	U	U	U	U
4MW-4 (18-23')	49	U	1,000	U	U	U	U	U	U	U	U	U	U
4MW-4 (23-28')	U	U	U	U	U	U	U	U	U	U	U	U	U
4SB-3 (0-2')	U	U	U	U	U	U	U	U	U	U	U	3,100	U
4SB-3 (6-8')	U	U	U	U	U	U	15,000	U	U	U	U	U	U
4SB-3 (12-14')	820	U	330	U	U	U	U	U	U	U	U	U	U

Notes:

U Not quantified above PQLs

* Duplicate Sample

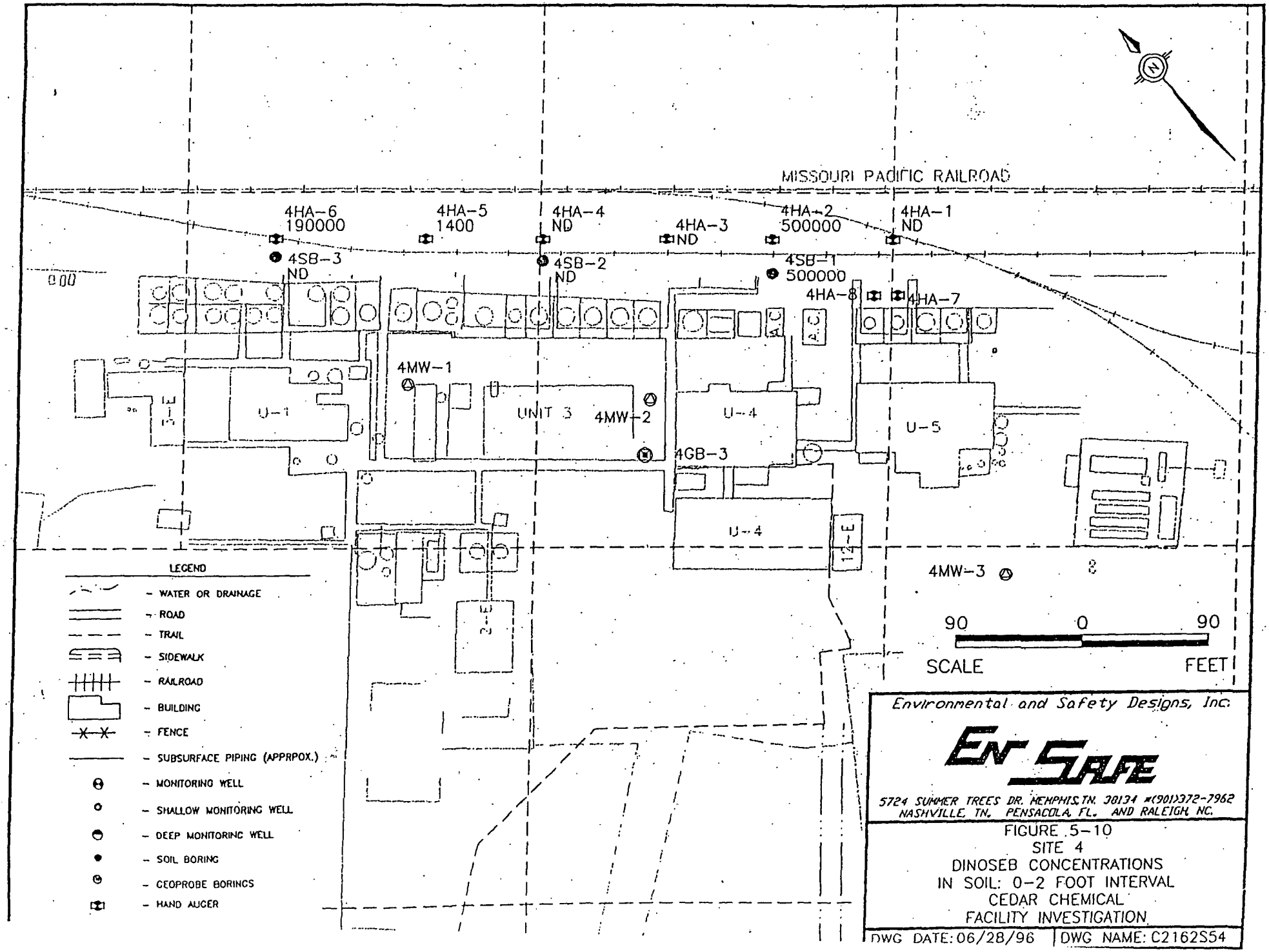

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FIGURE 5-10
SITE 4
DINOSEB CONCENTRATIONS
IN SOIL: 0-2 FOOT INTERVAL
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 06/28/96 | DWG NAME: C2162S54

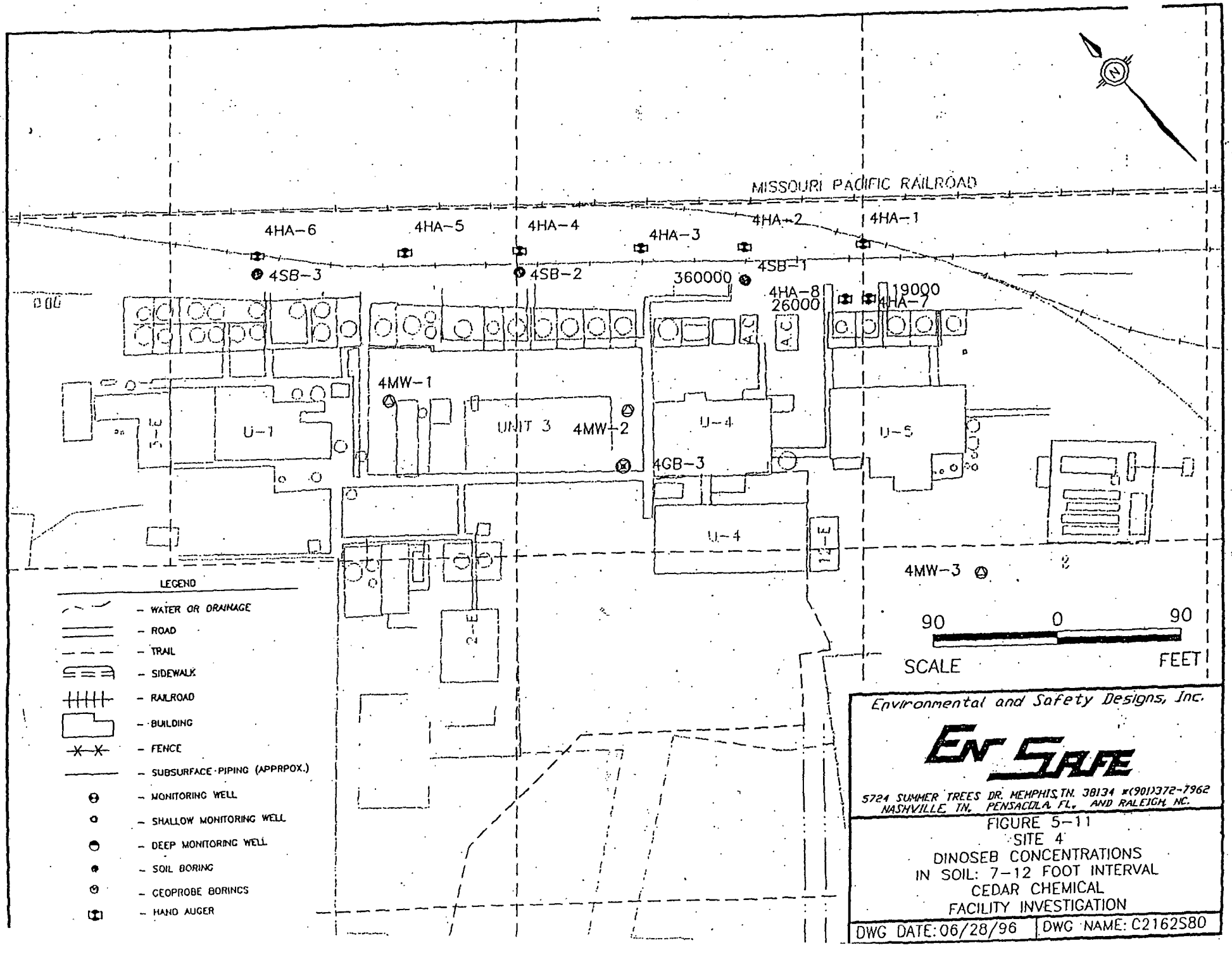

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FIGURE 5-11
SITE 4
DINOSEB CONCENTRATIONS
IN SOIL: 7-12 FOOT INTERVAL
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 06/28/96 | DWG NAME: C2162S80

Table 5-12
Cedar Chemical
Phase 1 Facility Investigation
Site 5 Soil Data

Compound	5SB-1 (16-18')	5SB-1 (21-23')	5SB-2 (16-18')	5SB-2 (21-23')	5SB-3 (16-18')	5SB-3 23-25')
Volatiles (ppb)						
Ethylbenzene	U	U	3	U	U	U
1,2-Dichloroethane	U	U	U	U	U	4
4-Methyl-2-Pentanone	U	U	35	U	1	170
Toluene	U	U	210	300	U	6
Total Xylenes	U	20	31	U	U	6
Acetone	U	U	6,800	3,900	U	21,000
Chloroform	U	U	U	U	U	4
Methylene Chloride	18	140	8	U	21	33
2-Butanone	U	U	21,000	44,000	U	120
Semivolatiles (ppb)						
2,4-Dinitrophenol	U	U	23,000	49,000	U	U
4,6-Dinitro-2-methylphenol	U	U	200	U	U	U
Dinoseb	U	U	170,000	57,000	U	U
3,4-Dichloroaniline	U	1,200	U	U	U	U
Pesticides (ppb)						
alpha-BHC	U	U	4	7	U	U
Endosulfan II	U	U	12	6	U	U
Lindane	U	U	U	6	U	U
Metals (ppm)						
Lead	8	10	9	8	10	10
Arsenic	7	9	8	8	9	10
Barium	129	147	168	134	126	141
Cadmium	U	U	U	U	U	0
Chromium	10	11	12	10	9	10

Note:
U Not quantified above PQLs

Table 5-13
Cedar Chemical
Phase I Facility Investigation
Site 6 Soil Data

Compound	6SB-A (-5')	6SB-A (5-10')	6SB-C (0-5')	6SB-C (5-10')	6SB-D (0-5')
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U
4-Methyl-2-Pentanone	U	U	U	2	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U
Total Xylenes	U	U	U	U	U
2-Hexanone	U	U	U	U	U
Acetone	53	U	5	U	8
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	U	U	14	23	20
2-Butanone	U	U	U	U	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	90	110
Propanil	U	U	700	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	U	98	U	U	U
Dinoseb	9,500	430	14,000	U	6,100
3,4-Dichloroaniline	U	U	230	U	U
Pesticides (ppb)					
Aldrin	4	U	U	U	U
alpha-BHC		U	3	U	U
beta-BHC	7	U	U	U	U
4,4'-DDT	58	U	U	U	U
Dieldrin	30	6	U	U	U
Methoxychlor	U	U	U	U	U
4,4'-DDD	U	U	U	U	U
4,4'-DDE	26	U	U	U	U
Metals (ppm)					
Lead	14	13	9	11	11
Arsenic	7	10	6	10	7
Barium	251	398	93	187	123
Cadmium	U	U	U	0	U
Chromium	15	10	11	10	14

Notes:
U Not detected above PQLs

Table 5-13
Cedar Chemical
Phase I Facility Investigation
Site 6 Soil Data

Compound	6SB-D (5-10')	6SB-E (0-5')	6SB-E (5-10')	6SB -F (0-5')	6SB-F (5-10')
Volatiles (ppb)					
Ethylbenzene	U	U	U	2	6
1,2-Dichloroethane	9	U	U	U	U
4-Methyl-2-Pentanone	500	U	U	U	1
Toluene	U	U	U	2	10
Chlorobenzene	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U
Total Xylenes	U	U	U	8	43
2-Hexanone	U	U	U	U	3
Acetone	860	67	31	U	240
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	U	U	U	U	14
2-Butanone	49	U	U	U	93
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	8,100	U
Phenol	6,900	U	U	U	U
Bis-(2-ethylhexyl)phthalate	104	U	U	U	U
Propanil	910	U	103	1,300	18,000
Isophorone	4,500	U	U	U	U
Di-n-butylphthalate	U	U	U	U	U
Dinoseb	U	U	10,000	16,000	21,000
3,4-Dichloroaniline	610	84	U	U	4,900
Pesticides (ppb)					
Aldrin	U	18	U	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
4,4'-DDT	U	21	U	U	U
Dieldrin	U	9	U	U	U
Methoxychlor	U	510	3,400	U	U
4,4'-DDD	U	28	U	U	U
4,4'-DDE	U	9	U	10	U
Metals (ppm)					
Lead	9	10	11	12	11
Arsenic	7	9	8	7	6
Barium	144	126	134	164	152
Cadmium	U	U	U	U	U
Chromium	9	10	12	9	13

Notes:
U Not detected above PQLs

Table 5-13
Cedar Chemical
Phase I Facility Investigation
Site 6 Soil Data

Compound	6SB- G (0-5')	6SB- G (5-10')	6 SB- H (0-5')	6SB-H (5-10')	6SB-J (5-10')
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U
4-Methyl-2-Pentanone	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U
Total Xylenes	U	U	U	U	U
2-Hexanone	U	U	U	U	U
Acetone	890	15	37	U	55
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	U	U	U	U	U
2-Butanone	U	U	U	3	U
Semivolatiles (ppb)					
4-Nitrophenol	U	U	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Propanil	U	U	U	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	200	170	102	U	U
Dinoseb	45,000	5,300	7,700	10,200	1,000
3,4-Dichloroaniline	1,600	U	U	U	U
Pesticides (ppb)					
Aldrin	U	U	U	U	U
alpha-BHC	U	4	U	U	3
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	200	190	U
Dieldrin	U	U	U	U	U
Methoxychlor	U	U	U	U	U
4,4'-DDD	U	U	U	U	16
4,4'-DDE	U	U	48	46	4
Metals (ppm)					
Lead	10	12	9	11	13
Arsenic	7	7	5	6	8
Barium	101	103	103	86	127
Cadmium	U	U	U	U	U
Chromium	11	13	9	14	12

Notes:
U Not detected above PQLs

Table 5-13
Cedar Chemical
Phase I Facility Investigation
Site 6 Soil Data

Compound	6SB-J (10-15')	6SB-K (0-5')	6SB-K (5-10')	6SB-L (0-5')	6SB-L (5-10')
Volatiles (ppb)					
Ethylbenzene	U	U	U	U	U
1,2-Dichloroethane	9	U	U	U	U
4-Methyl-2-Pentanone	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U
Total Xylenes	U	U	U	U	U
2-Hexanone	U	U	U	U	U
Acetone	U	180	25	27	U
Chloroform	U	U	U	U	U
Benzene	U	U	U	U	U
Methylene Chloride	10	U	24	U	41
2-Butanone	U	U	U	U	U
Semivolatiles (ppb)	U	U	U	U	U
4-Nitrophenol	U	U	U	U	U
Phenol	U	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U	U
Propanil	U	U	U	U	U
Isophorone	U	U	U	U	U
Di-n-butylphthalate	150	U	200	U	U
Dinoseb	U	4,100	1,060	U	U
3,4-Dichloroaniline	U	U	U	U	U
Pesticides (ppb)					
Aldrin	U	U	240	U	U
alpha-BHC	U	U	U	U	U
beta-BHC	U	U	U	U	U
4,4'-DDT	U	U	U	U	U
Dieldrin	U	U	U	U	U
Methoxychlor	U	98,000	U	U	U
4,4'-DDD	U	U	U	U	28
4,4'-DDE	U	U	U	U	23
Metals (ppm)					
Lead	12	12	13	7	11
Arsenic	7	9	9	6	6
Barium	150	115	108	111	79
Cadmium	U	0	U	U	U
Chromium	10	11	12	10	15

Notes:
U Not detected above PQLs

Table 5-14
Cedar Chemical
Phase I Facility Investigation
Interim Measure Data

Compound	IMSB-1 (1-3')	IMSB-1 (3-8')	IMSB-1 (8-12')	IMSB-2 (1-5')	IMSB-2 (5-10
Volatiles (ppb)					
1,2-Dichloroethane	U	U	NA	U	
Toluene	U	U	NA	U	
Acetone	U	200	NA	240	32
Methylene Chloride	U	U	NA	U	
Semivolatiles (ppb)					
Phenol	U	U	U	U	
Propanil	U	U	U	U	
Dinoseb	U	63,000	U	U	2,90
3,4-Dichloroaniline	U	U	U	U	6,70
Pesticides (ppb)					
Aldrin	420	U	U	U	
alpha-BHC	U	U	U	U	
beta-BHC	U	U	U	U	
delta-BHC	U	U	26	U	
4,4'-DDT	890	U	U	55	
Lindane	U	3	U	U	
Dieldrin	U	U	U	7	
Endrin	250	U	U	U	
Methoxychlor	U	U	U	600	
4,4'-DDD	U	U	U	U	
4,4'-DDE	190	U	U	U	
Heptachlor	U	U	U	U	
Metals (ppb)					
Lead	13	12	NA	7	
Arsenic	59	9	NA	3	
Barium	313	143	NA	82	
Chromium	12	9	NA	8	
Selenium	0	0	NA	U	

Notes:
U Not quantified above PQLs

Table 5-14
Cedar Chemical
Phase I Facility Investigation
Interim Measure Data

Compound	IMSB-2 (10-15')	IMSB-3 (1-5')	IMSB-3 (5-10')	IMSB-3 (10-15')	IMSB-4 (1-5')	
Volatiles (ppb)						
1,2-Dichloroethane	10	U	U	NA		U
Toluene	U	U	U	NA		U
Acetone	U	U	U	NA		U
Methylene Chloride	66		12	NA		U
Semivolatiles (ppb)						
Phenol	U	U	1,000	U		U
Propanil	8,800	U	U	U		U
Dinoseb	U	U	12,000	U		U
3,4-Dichloroaniline	U	U	2,600	U		
Pesticides (ppb)						
Aldrin	U	U	9	U		
alpha-BHC	55	U	U	U		
beta-BHC	U	U	37	U		
delta-BHC	U	U	U	U		
4,4'-DDT	U	U	U	U		
Lindane	U	U	3	U		
Dieldrin	350	U	U	U		5
Endrin	U	U	U	U		
Methoxychlor	U	U	U	U		
4,4'-DDD	U	U	10	U		
4,4'-DDE	U	U	U	U		
Heptachlor	U	U	5	U		
Metals (ppm)						
Lead	NA	9	13	NA		
Arsenic	NA	7	7	NA		
Barium	NA	130	231	NA		1
Chromium	NA	13	14	NA		
Selenium	NA	U	0	NA		

Notes:
U Not quantified above PQLs
NA Laboratory did not analyzed for that method.

Table 5-14
Cedar Chemical
Phase I Facility Investigation
Interim Measure Data

Compound	IMSB-4 (5-10')	IMSB-4 (10-15')	IMSB-5 (1-5')	IMSB-5 (5-10')	IMSB-5 (10-15')
Volatiles (ppb)					
1,2-Dichloroethane	U	NA	U	U	N
Toluene	U	NA	U	U	N
Acetone	U	NA	U	U	N
Methylene Chloride	U	NA	U	U	N
Semivolatiles (ppb)					
Phenol	U	U	U	U	
Propanil	U	U	U	U	
Dinoseb	U	U	U	U	
3,4-Dichloroaniline	U	U	U	U	
Pesticides (ppb)					
Aldrin	U	NA	U	U	
alpha-BHC	U	NA	U	U	
beta-BHC	U	NA	U	U	
delta-BHC	U	NA	U	U	
4,4'-DDT	U	NA	U	U	
Lindane	U	NA	U	U	
Dieldrin	U	NA	13	U	
Endrin	U	NA	U	U	
Methoxychlor	U	NA	U	U	
4,4'-DDD	U	NA	U	U	
4,4'-DDE	U	NA	U	U	
Heptachlor	U	NA	U	U	
Metals (ppm)					
Lead	13	NA	11	10	
Arsenic	9	NA	10	7	
Barium	156	NA	146	122	
Chromium	17	NA	12	12	
Selenium	0	NA	0	0	

Notes:
U Not quantified above PQLs
NA Laboratory did not analyzed for that method

Table 5-15
Cedar Chemical
Phase II Facility Investigation
Site 6 Soil Data

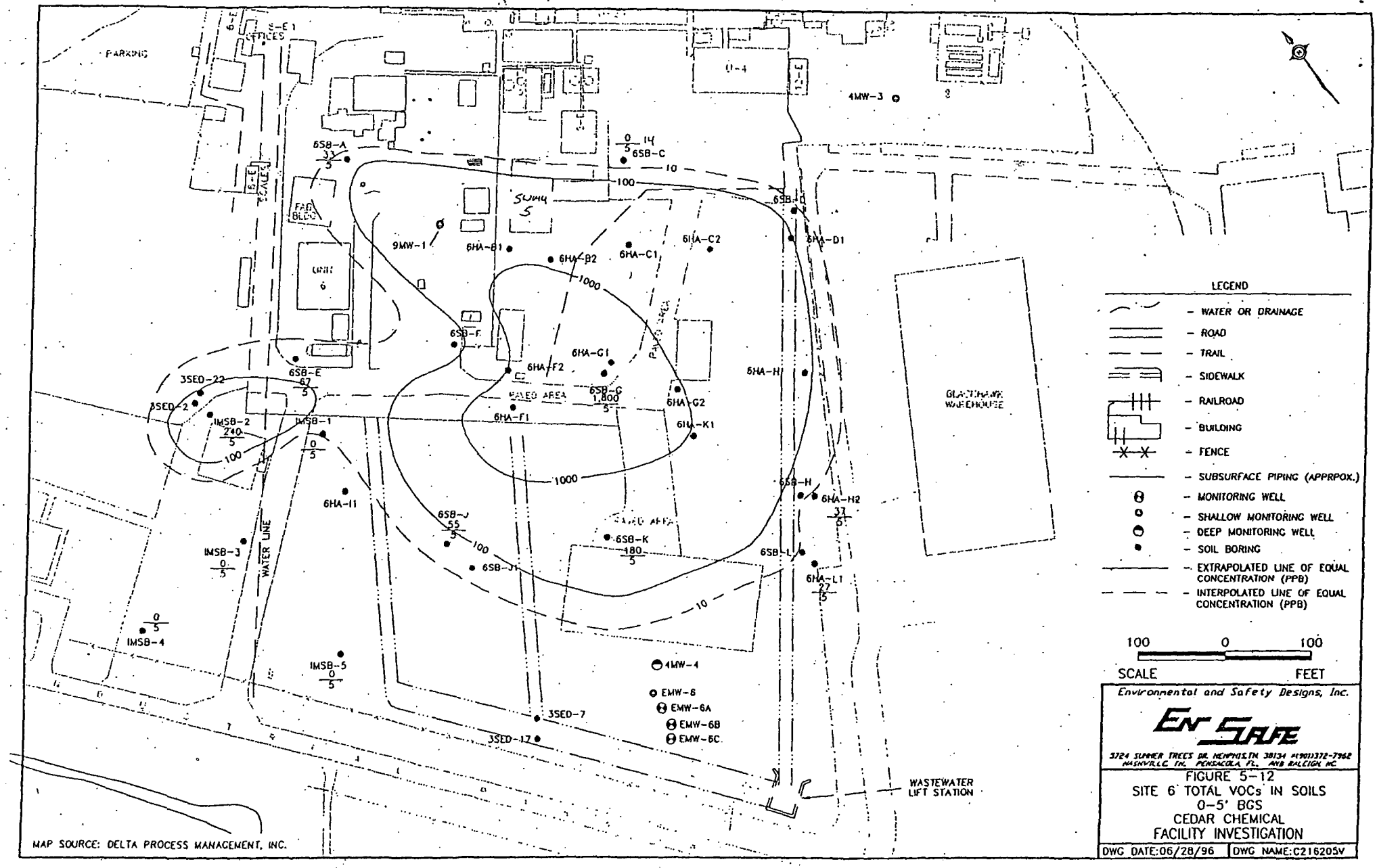
Compounds Detected

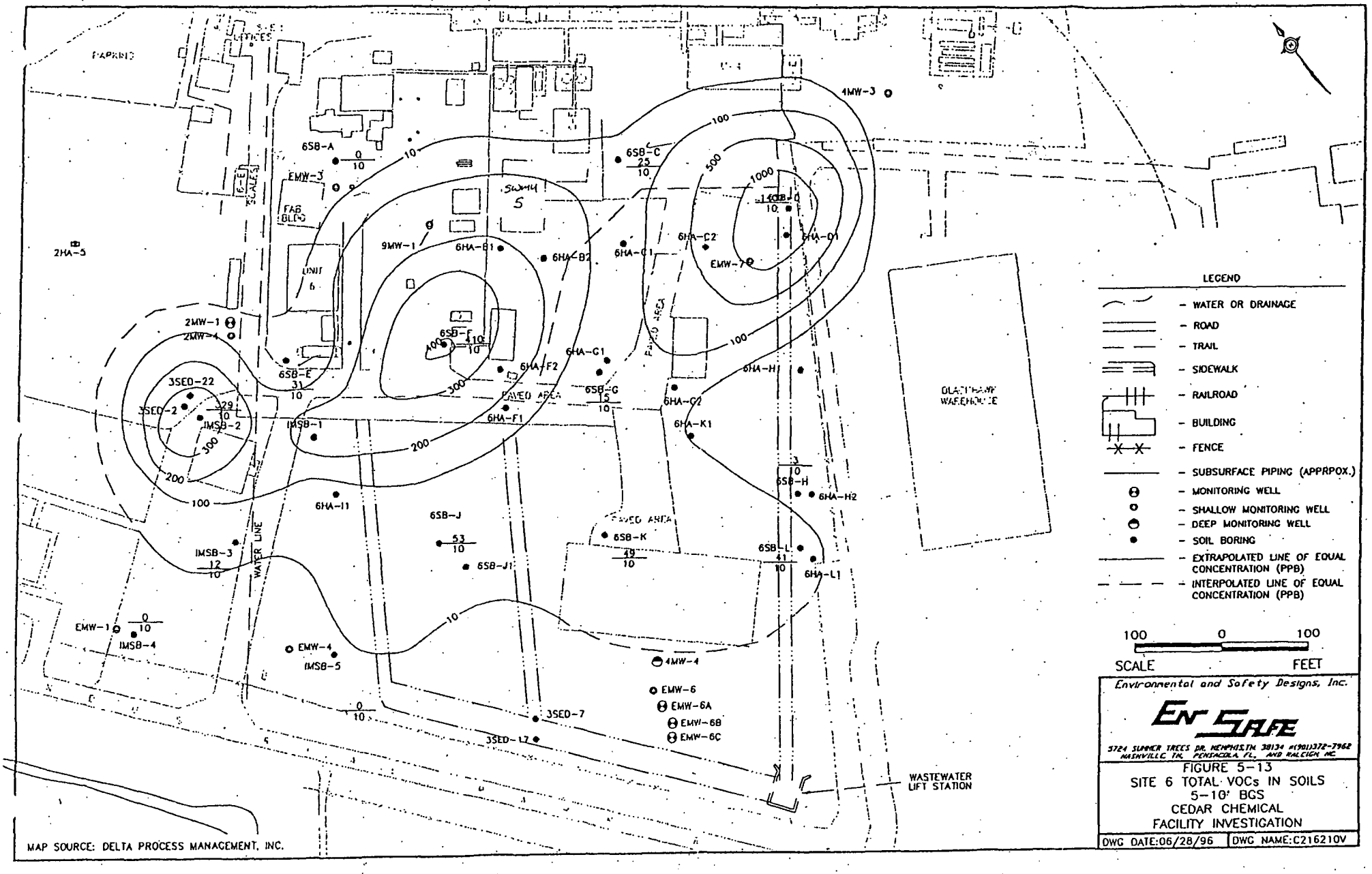
	Semivolatiles (ppb)			Pesticides (ppb)							
	Benzo(a)Anthracene	Chrysene	Dinoseb	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Methoxychlor	Toxaphene
6HA-B1 (0-1')	870	870	160,000	U	U	U	U	U	34	5,000	U
6HA-B2 (0-1')	U	U	5,600	150	27	U	15	U	U	240	U
6HA-C1 (0-1')	U	U	110,000	25	U	U	U	26	U	9,200	14,000
6HA-C2 (0-1')	U	U	5,600	47	U	U	24	78	U	1,300	U
6HA-D1 (0-1')	U	U	9,100	U	25	190	U	U	22	1,500	U
6HA-F1 (0-1')	U	U	3,800	46	U	44	17	36	U	300	U
6HA-F2 (0-1')	U	U	U	U	U	U	U	U	U	170	U
6HA-G1 (0-1')*	U	U	U	U	U	U	U	U	U	300	U
6HA-G1 (0-1')	U	U	U	U	U	U	U	U	U	350	U
6HA-G2 (0-1')	U	U	2,200	U	U	U	U	U	U	2,500	U
6HA-H1 (0-1')	U	U	U	120	73	58	U	U	U	U	U
6HA-H2 (0-1')	U	U	U	U	U	U	U	18	U	340,000	U
6HA-J1 (0-1')	U	U	2,900	31	U	27	14	42	U	420	U
6HA-K1 (0-1')	U	U	960	U	U	U	U	44	U	820	U
6HA-L1 (0-1')	U	U	U	84	64	140	5	29	63	210	2,500

Notes:

U Not quantified above PQLs

* Duplicate Sample


PARKING
OFFICES
S-E1
FAB BLDG
S-E
SCALE
UNIT 6
0-4
12-E
4MW-3
6SB-A
33
5
6SB-C
0
14
5
10
100
SUM 4
5
6SB-D
9MW-1
6HA-B1
6HA-B2
6HA-C1
6HA-C2
6HA-D1
1000
6SB-F
6HA-G1
6HA-F2
6SB-E
67
5
3SED-22
3SED-2
6SB-G
1,800
5
6HA-G2
6HA-F1
6HA-H
GLACTHAWK WAREHOUSE
IMSB-2
240
5
IMSB-1
0
5
100
6HA-K1
1000
6SB-H
6HA-H2
37
5
6HA-I1
6SB-J
55
5
100
6SB-K
180
5
6SB-L
IMSB-3
0
5
WATER LINE
6SB-J1
6HA-L1
27
5
10
0
5
IMSB-4
IMSB-5
0
5
4MW-4
EMW-6
EMW-6A
EMW-6B
EMW-6C
3SED-7
3SED-17
WASTEWATER LIFT STATION
MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.
LEGEND
- WATER OR DRAINAGE
- ROAD
- TRAIL
- SIDEWALK
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- SOIL BORING
- EXTRAPOLATED LINE OF EQUAL CONCENTRATION (PPB)
- INTERPOLATED LINE OF EQUAL CONCENTRATION (PPB)
100 0 100
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
3724 SUMMER TREES DR. MEMPHIS,TN 38134 (901)372-7962
NASHVILLE TN. PENSACOLA FL. AND RALEIGH NC.
FIGURE 5-12
SITE 6 TOTAL VOCs IN SOILS
0-5' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C216205V



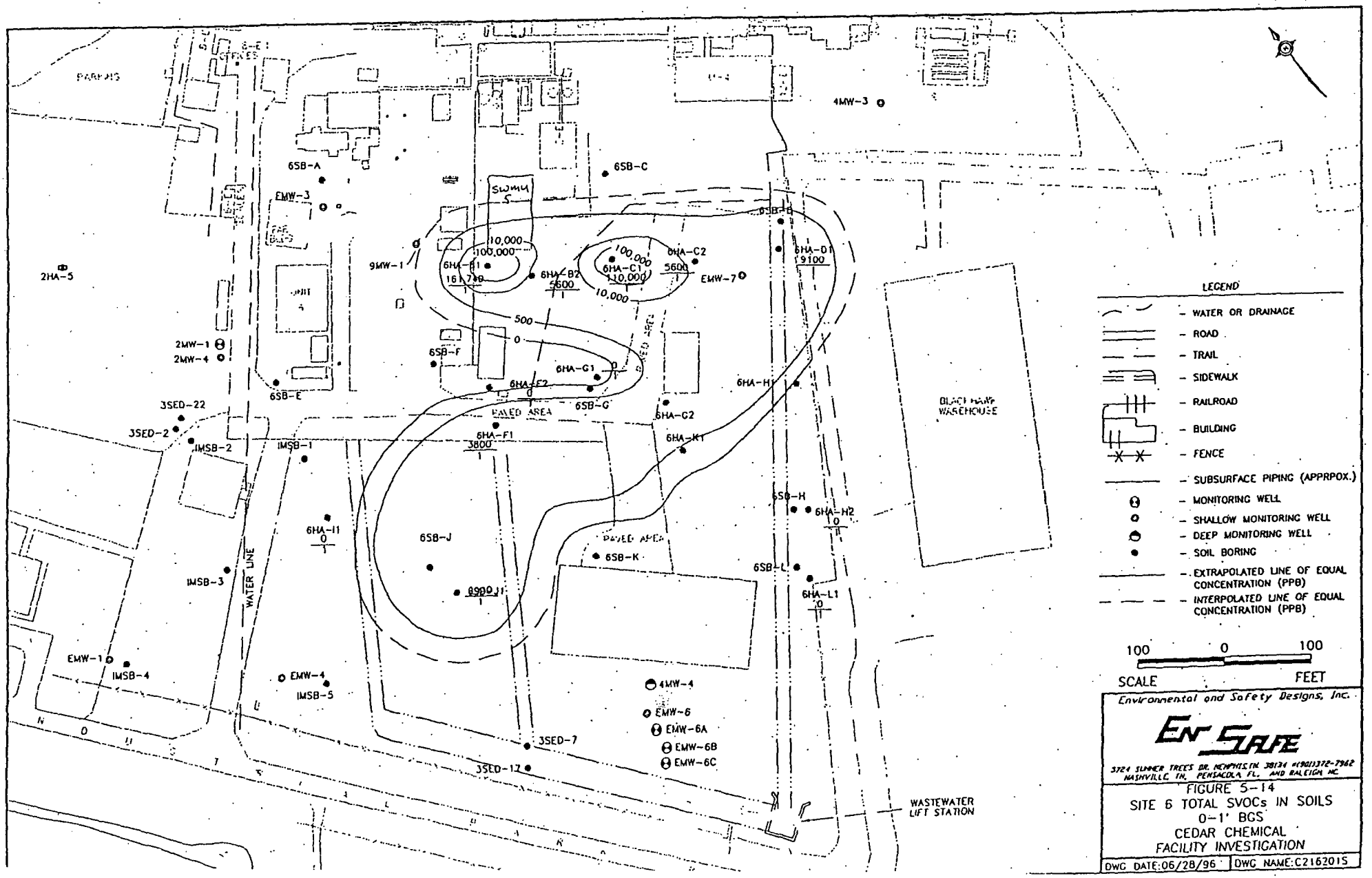
Environmental and Safety Designs, Inc.

EnSafe

5724 SUMMER TREES DR. MEMPHIS,TN 38134 ph(901)372-7962
NASHVILLE TN, PENSACOLA FL, AND RALEIGH NC

FIGURE 5-13
SITE 6 TOTAL VOCs IN SOILS
5-10' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE:06/28/96 | DWG NAME:C216210V



Environmental and Safety Designs, Inc.

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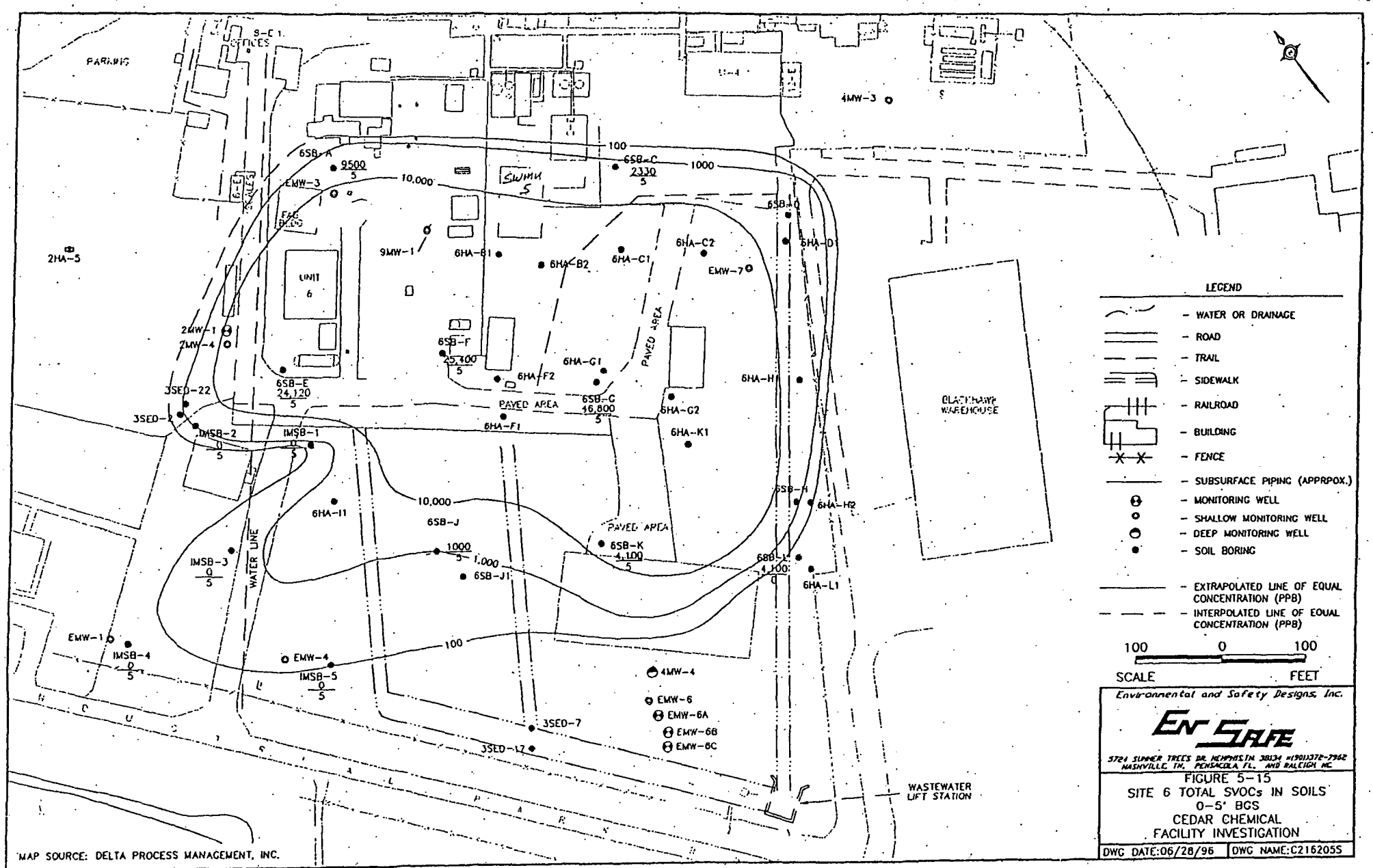
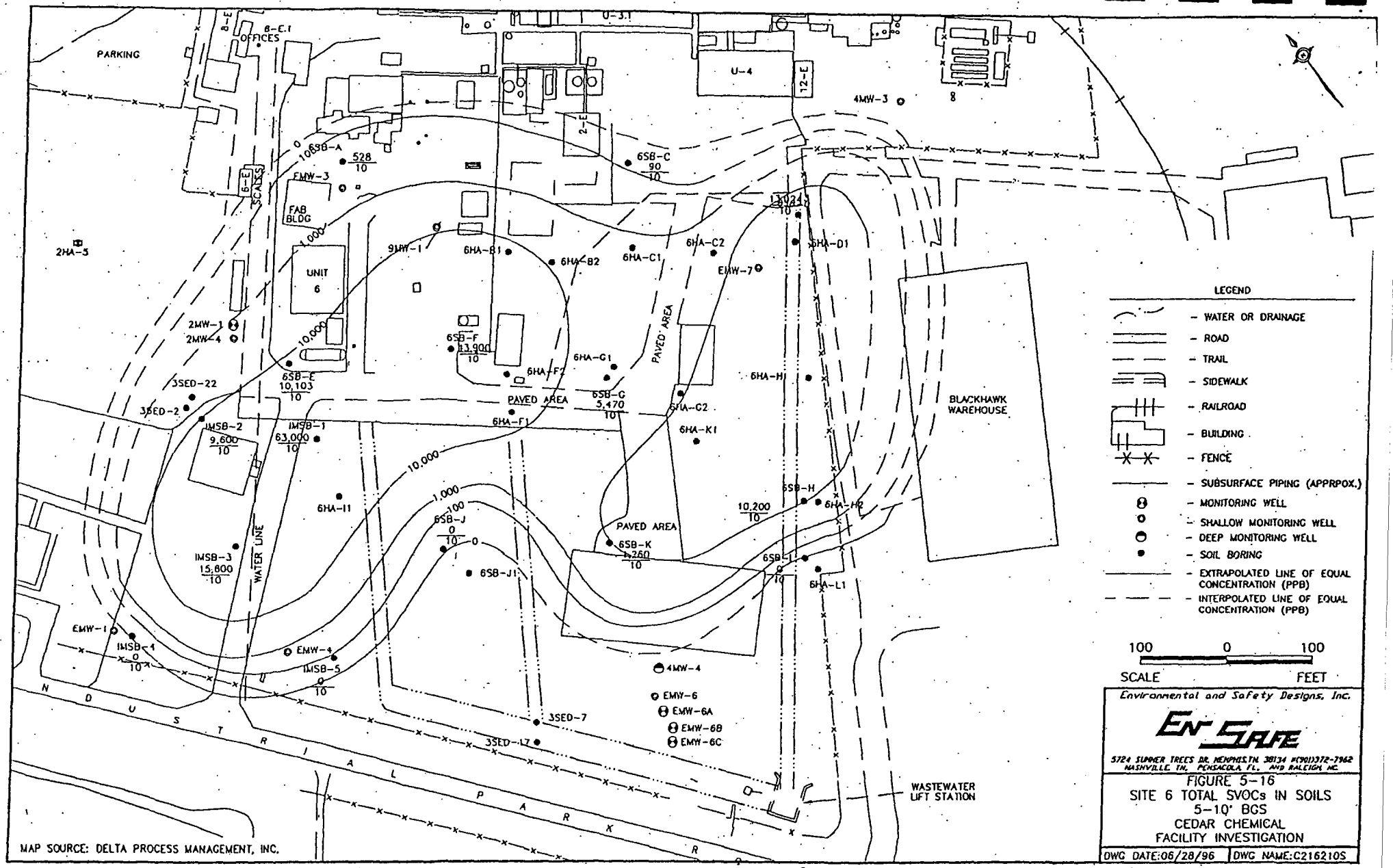
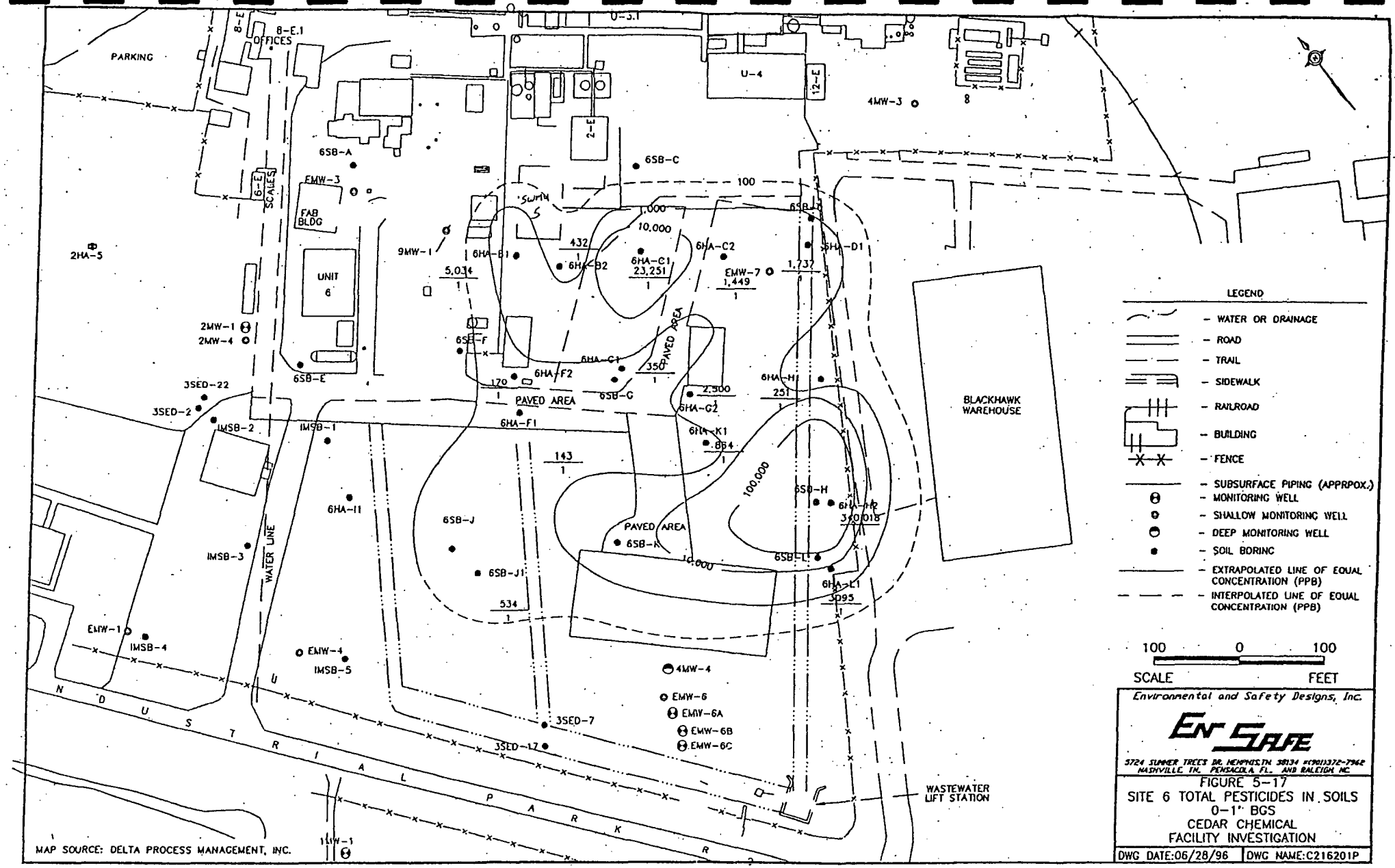
3724 SUMMER TREES DR. MEMPHIS TN. 38134 (901)372-7962
NASHVILLE TN. PENSACOLA FL. AND RALEIGH NC.

FIGURE 5-14
SITE 6 TOTAL SVOCs IN SOILS
0-1' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE:06/28/96 | DWG NAME:C216201S


PARKING
OFFICES
SCALES
FAC BLDG
SWIMM
UNIT 6
PAVED AREA
BLACKHAWK WAREHOUSE
WATER LINE
RAILROAD
6SB-A 9500 5
6SB-C 2330 5
6SB-F 25,400 5
6SB-E 24,120 5
6SB-C 16,800 5
6SB-K 4,100 5
6SB-L 4,100 0
6SB-I
6SB-J
6SB-J1
6SB-D
6HA-A1
6HA-B1
6HA-B2
6HA-C1
6HA-C2
6HA-D
6HA-E1
6HA-F1
6HA-F2
6HA-G1
6HA-G2
6HA-H1
6HA-H2
6HA-I1
6HA-K1
6HA-L1
2HA-5
9MW-1
4MW-3
4MW-4
EMW-1
EMW-2
EMW-3
EMW-4
EMW-6
EMW-6A
EMW-6B
EMW-6C
EMW-7
IMSB-1 0 5
IMSB-2 0 5
IMSB-3 0 5
IMSB-4 0 5
IMSB-5 0 5
3SED-1
3SED-2
3SED-22
3SED-7
3SED-12
100
1000
10,000
WASTEWATER LIFT STATION
MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.
LEGEND
– WATER OR DRAINAGE
– ROAD
– TRAIL
– SIDEWALK
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPING (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITORING WELL
– DEEP MONITORING WELL
– SOIL BORING
– EXTRAPOLATED LINE OF EQUAL CONCENTRATION (PPB)
– INTERPOLATED LINE OF EQUAL CONCENTRATION (PPB)
100 0 100
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS TN 38134 (901)372-7962
NASHVILLE TN, PENSACOLA FL, AND RALEIGH NC
FIGURE 5-15
SITE 6 TOTAL SVOCs IN SOILS
0-5' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C216205S


PARKING
B-E
B-C.1
OFFICES
U-3.1
U-4
12-E
4MW-3
8
2-E
6SB-A
528
10
6SB-C
90
10
FMW-3
SCALES
6-E
FAB BLDG
UNIT 6
9MW-1
6HA-B1
6HA-B2
6HA-C1
6HA-C2
EMW-7
6HA-D1
2HA-5
2MW-1
2MW-4
6SB-F
13,900
10
6HA-G1
6HA-F2
6SB-E
10,103
10
PAVED AREA
6SB-G
5,470
10
6HA-F1
6HA-G2
6HA-H
BLACKHAWK WAREHOUSE
6HA-K1
3SED-22
3SED-2
IMSB-2
9,600
10
IMSB-1
63,000
10
6HA-I1
WATER LINE
IMSB-3
15,600
10
6SB-J
0
10
6SB-J1
6SB-K
260
10
PAVED AREA
6SB-H
6HA-H2
10,200
10
6SB-L
0
10
6HA-L1
EMW-1
IMSB-4
0
10
EMW-4
IMSB-5
0
10
4MW-4
EMW-6
EMW-6A
EMW-6B
EMW-6C
3SED-7
3SED-L7
N D U S T R I A L P A R K R O
WASTEWATER LIFT STATION
MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.
LEGEND
- WATER OR DRAINAGE
- ROAD
- TRAIL
- SIDEWALK
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- SOIL BORING
- EXTRAPOLATED LINE OF EQUAL CONCENTRATION (PPB)
- INTERPOLATED LINE OF EQUAL CONCENTRATION (PPB)
100 0 100
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS TN. 38134 (901)372-7962
NASHVILLE TN. PENSACOLA FL. AND RALEIGH NC.
FIGURE 5-16
SITE 6 TOTAL SVOCs IN SOILS
5-10' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C216210S



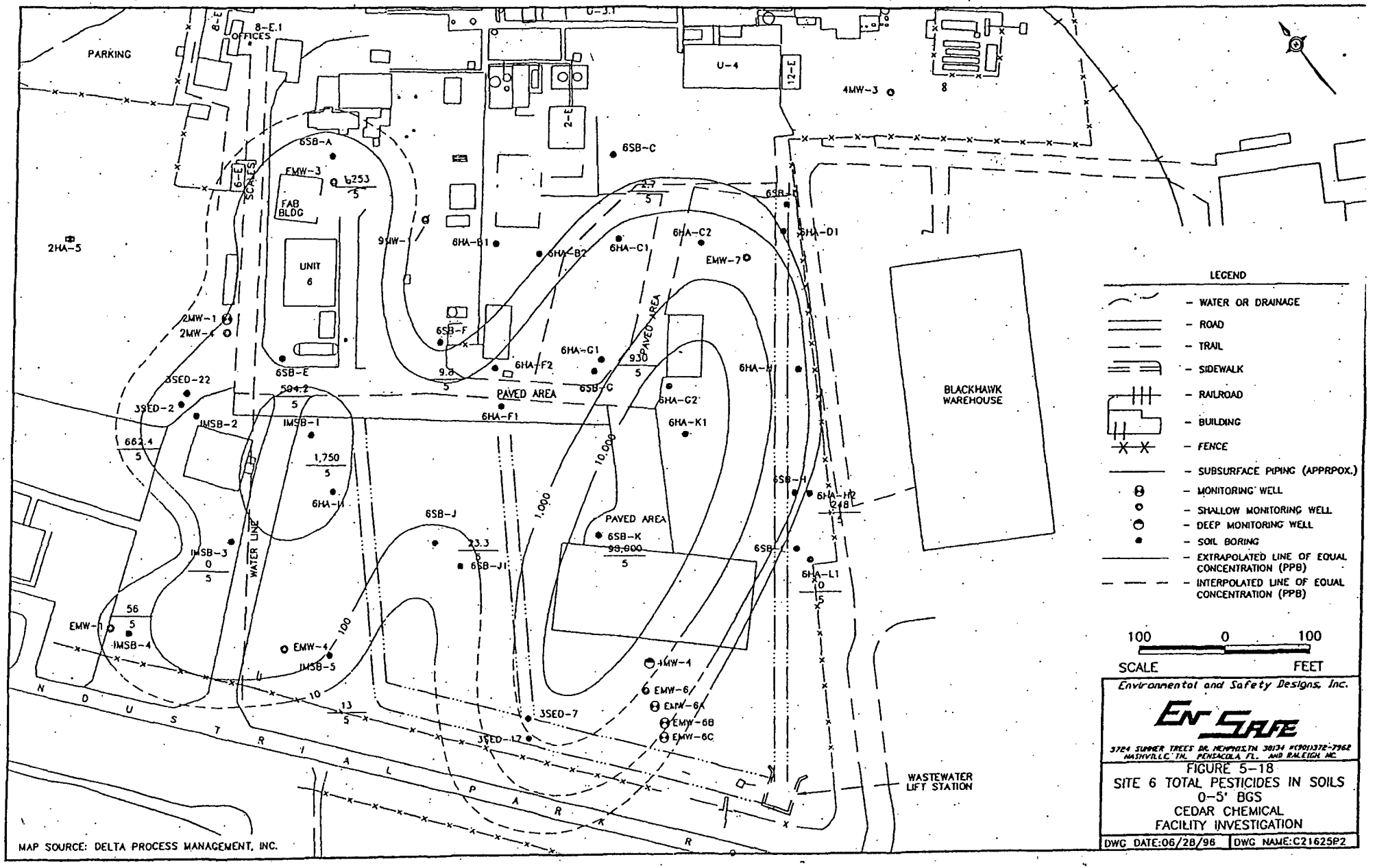
Environmental and Safety Designs, Inc.

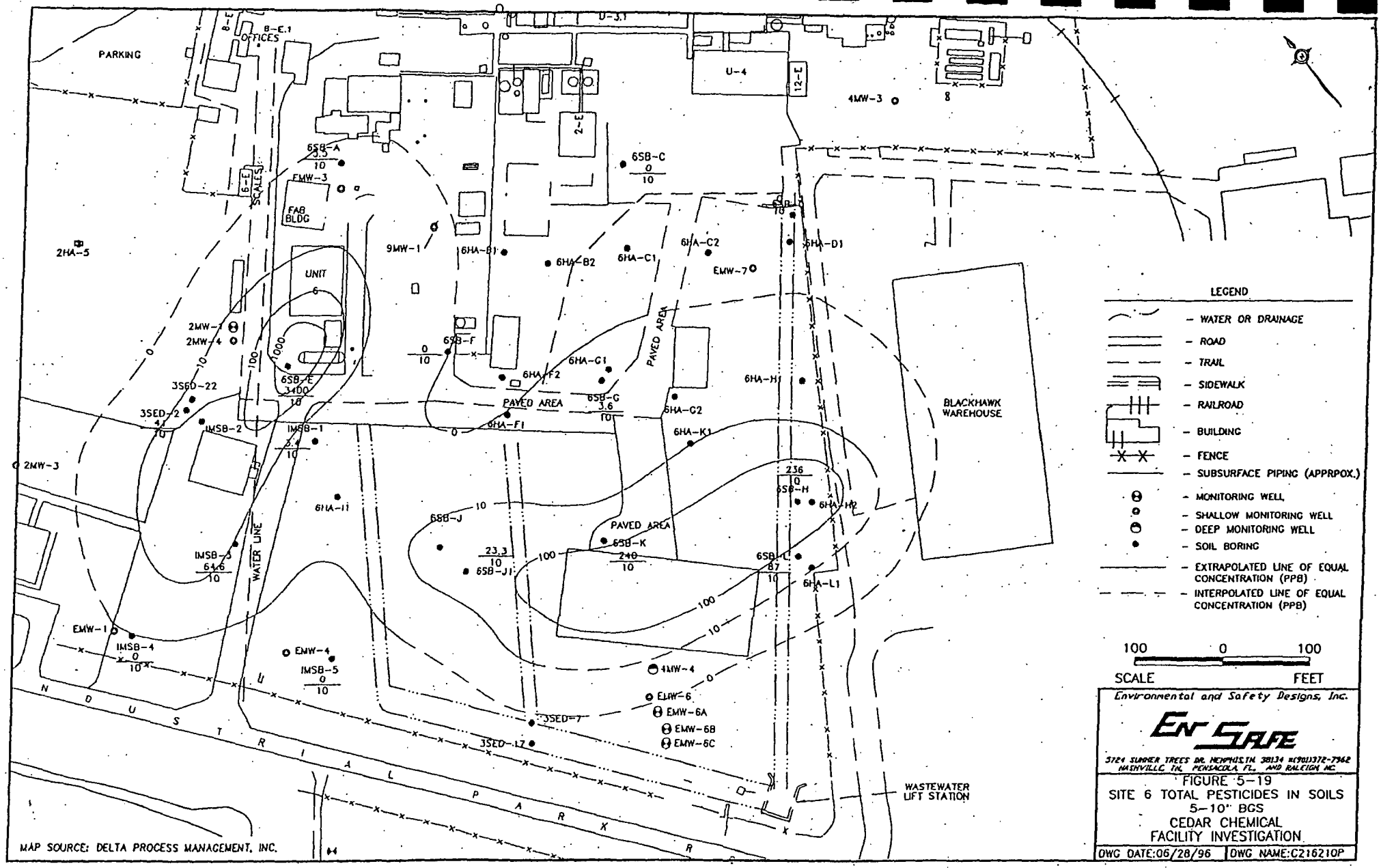
EnSafe

3724 SUMMER TREES DR. MEMPHIS,TN 38134 ☎(901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC

FIGURE 5-17
SITE 6 TOTAL PESTICIDES IN SOILS
0-1' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE:06/28/96 | DWG NAME:C216201P


PARKING
8-E.1
OFFICES
U-4
12-E
4MW-3
2-E
6SB-A
6SB-C
EMW-3
6253
5
FAB BLDG
6-E
SCALES
2HA-5
UNIT 6
6HA-B1
6HA-B2
6HA-C1
6HA-C2
6HA-D1
EMW-7
2MW-1
2MW-4
6SB-F
6HA-G1
6HA-F2
6SB-E
504.2
5
3SED-22
3SED-2
IMSB-2
IMSB-1
PAVED AREA
6HA-F1
6SB-G
6HA-G2
6HA-K1
BLACKHAWK WAREHOUSE
662.4
5
1,750
5
6HA-I1
6SB-J
PAVED AREA
6SB-K
99,000
5
6SB-H
6HA-H2
248
5
6SB-L
6HA-L1
10
5
IMSB-3
0
5
6SB-J1
23.3
5
WATER LINE
56
5
EMW-1
IMSB-4
EMW-4
IMSB-5
100
10
13
5
3SED-7
3SED-17
EMW-4
EMW-6
EMW-6A
EMW-6B
EMW-6C
NORTH INDUSTRIAL PARK
WASTEWATER LIFT STATION
MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.
LEGEND
WATER OR DRAINAGE
ROAD
TRAIL
SIDEWALK
RAILROAD
BUILDING
FENCE
SUBSURFACE PIPING (APPRPOX.)
MONITORING WELL
SHALLOW MONITORING WELL
DEEP MONITORING WELL
SOIL BORING
EXTRAPOLATED LINE OF EQUAL CONCENTRATION (PPB)
INTERPOLATED LINE OF EQUAL CONCENTRATION (PPB)
100 0 100
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
3724 SUMNER TREES DR. MEMPHIS,TN 38134 #(901)372-7962
NASHVILLE,TN. PENSACOLA,FL. AND RALEIGH,NC.
FIGURE 5-18
SITE 6 TOTAL PESTICIDES IN SOILS
0-5' BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C21625P2



Environmental and Safety Designs, Inc.

EN SAFE

3724 SUMMER TREES DR. MEMPHIS,TN. 38134 (901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.

FIGURE 5-19
SITE 6 TOTAL PESTICIDES IN SOILS
5-10" BGS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE:06/28/96 | DWG NAME:C216210P

Table 5-16
Cedar Chemical
Phase I Facility Investigation
Site 8 Soil Data

SKIP

Compound	CED1SHA6	CED1HA7	CED1HA8	CED1HA9
Volatiles (ppb)				
Ethylbenzene	U	U	U	U
1,2-Dichloroethane	U	U	U	U
4-Methyl-2-Pentanone	U	U	U	U
Toluene	U	U	U	U
Chlorobenzene	U	U	U	U
Tetrachloroethene	U	U	U	U
Total Xylenes	U	U	U	U
2-Hexanone	U	U	U	U
Acetone	U	U	U	U
Chloroform	U	U	U	U
Benzene	U	U	U	U
Methylene Chloride	U	U	U	U
2-Butanone	U	U	U	U
Semivolatiles (ppb)				
4-Methylphenol	U	U	U	U
1,2-Dichlorobenzene	U	U	U	U
Pyrene	U	U	U	U
Di-n-butylphthalate	U	U	U	U
Dinoseb	U	U	U	U
Bis-(2-ethylhexyl)phthalate	U	U	U	U
3,4-Dichloroaniline	U	U	U	U
Pesticides (ppb)				
Endosulfan Sulfate	U	U	U	U
Aldrin	U	U	U	U
beta-BHC	U	U	U	U
delta-BHC	U	U	U	U
4,4'-DDT	U	U	U	U
gamma-Chlordane	U	U	U	U
Lindane	U	U	U	U
Dieldrin	U	4	U	U
4,4'-DDD	U	U	U	U
4,4'-DDE	U	U	U	U
Metals (ppm)				
Lead	12.1	9.4	11.8	12.5
Arsenic	6.1	4.2	5.2	6.3
Silver	U	U	U	U
Barium	248	142	77.6	157
Cadmium	U	U	U	U
Chromium	22.9	18.7	21.7	16.5
Mercury	U	U	U	U

Note:
U Not detected above PQLs

Table 5-17
Cedar Chemical
Phase I Facility Investigation
Site 9 Soil Data

Compounds Detected

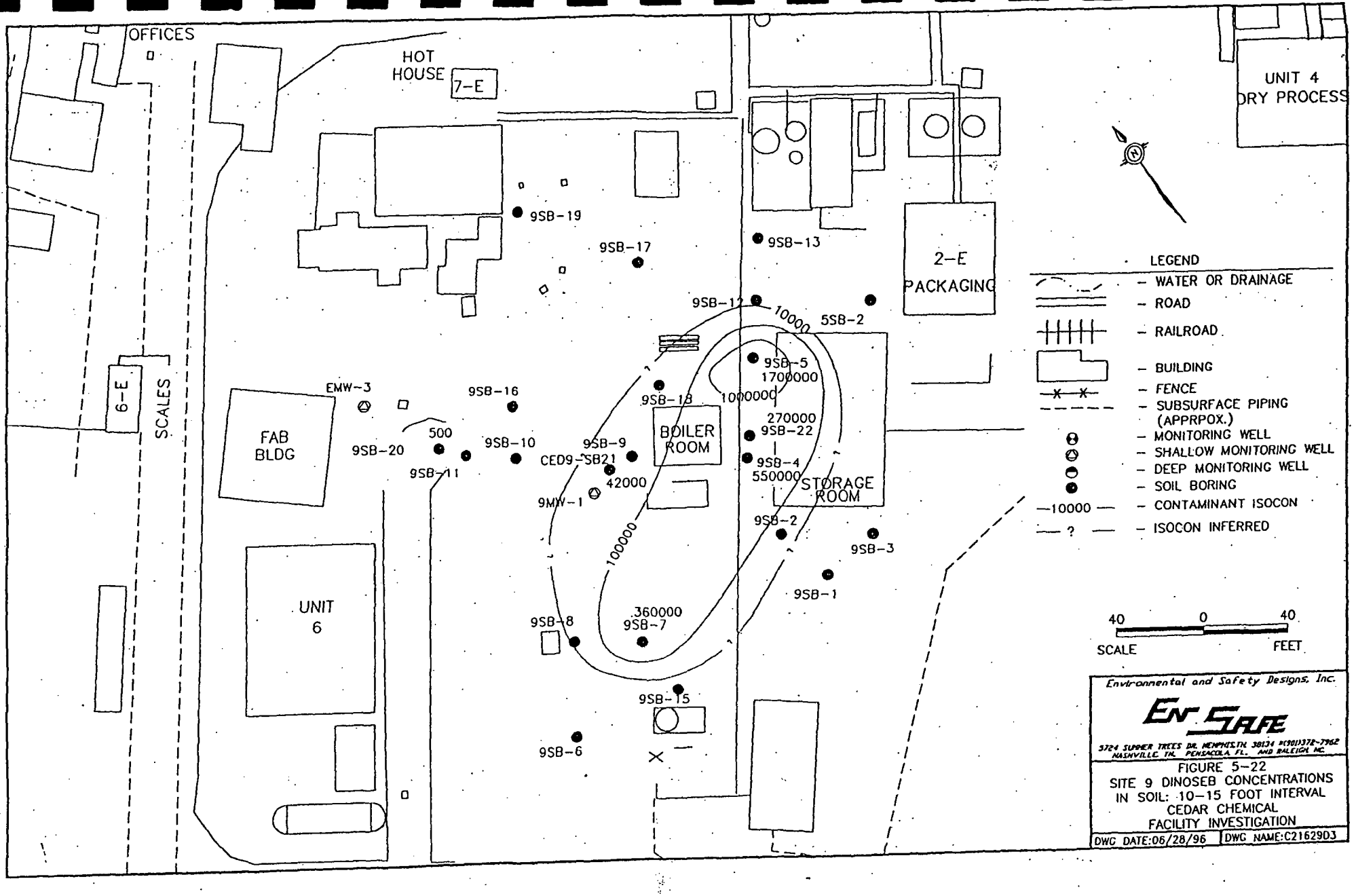
Sample	Semivolatiles (ppb) 2,4-Dinitrophenol	Propanil	Dinoseb	3,4-Dichloroaniline
9SB-1 (0-5')	U	U	38,000	U
9SB-1 (5-10')	U	310	9,600	U
9SB-2 (5-10')	3,400	150	1,600	U
9SB-3 (0-5')	U	11,000	140,000	76,000
9SB-3 (5-10')	U	U	U	130
9SB-4 (0-5')	U	4,000,000	24,000,000	U
9SB-4 (5-10')	U	U	8,500,000	U
9SB-4 (10-15')	U	U	550,000	U
9SB-5 (0-5')	U	U	29,000,000	U
9SB5 (5-10')	U	U	4,100,000	U
9SB-5 (10-15')	U	U	1,700,000	U
9SB-6 (0-5')	U	56,000	U	19,000
9SB-6 (5-10')	U	8,600	U	U
9SB-7 (0-5')	U	770,000	26,000,000	450,000
9SB-7 (5-10')	U	U	6,400,000	U
9SB-7 (10-15')	U	U	360,000	U
9SB-8 (0-5')	U	U	15,000,000	U
9SB-8 (5-10')	U	U	13,000	U
9SB-9 (0-5')	U	U	28,000,000	U
9SB-9 (5-10')	U	U	90,000	U
9SB-10 (0-5')	U	U	650,000	U
9SB-10 (5-10')	U	U	40,000	U
9SB-11 (0-5')	U	U	160,000	U
9SB-11 (5-10')	U	41,000	170,000	U
9SB-12 (0-5')	U	U	13,000,000	U
9SB-12 (5-10')	U	U	320,000	U
9SB-13 (0-5')	U	U	150,000	U
9SB-13 (5-10')	U	U	34,000	U
9SB-14 (0-5')	U	860	9,100	U
9SB-14 (5-10')	U	3,300	35,000	U
9SB-15 (0-5')	U	U	8,600	150
9SB-15 (5-10')	U	U	22,000	U
9SB-16 (0-5')	U	U	U	U
9SB-16 (5-10')	U	U	9,200	U
9SB-18 (0-5')	U	U	93,000	16,000
9SB-18 (5-10')	U	1,300	17,000	1,300
9SB-19 (0-5')	U	U	U	U
9SB-19 (5-10')	U	U	U	U

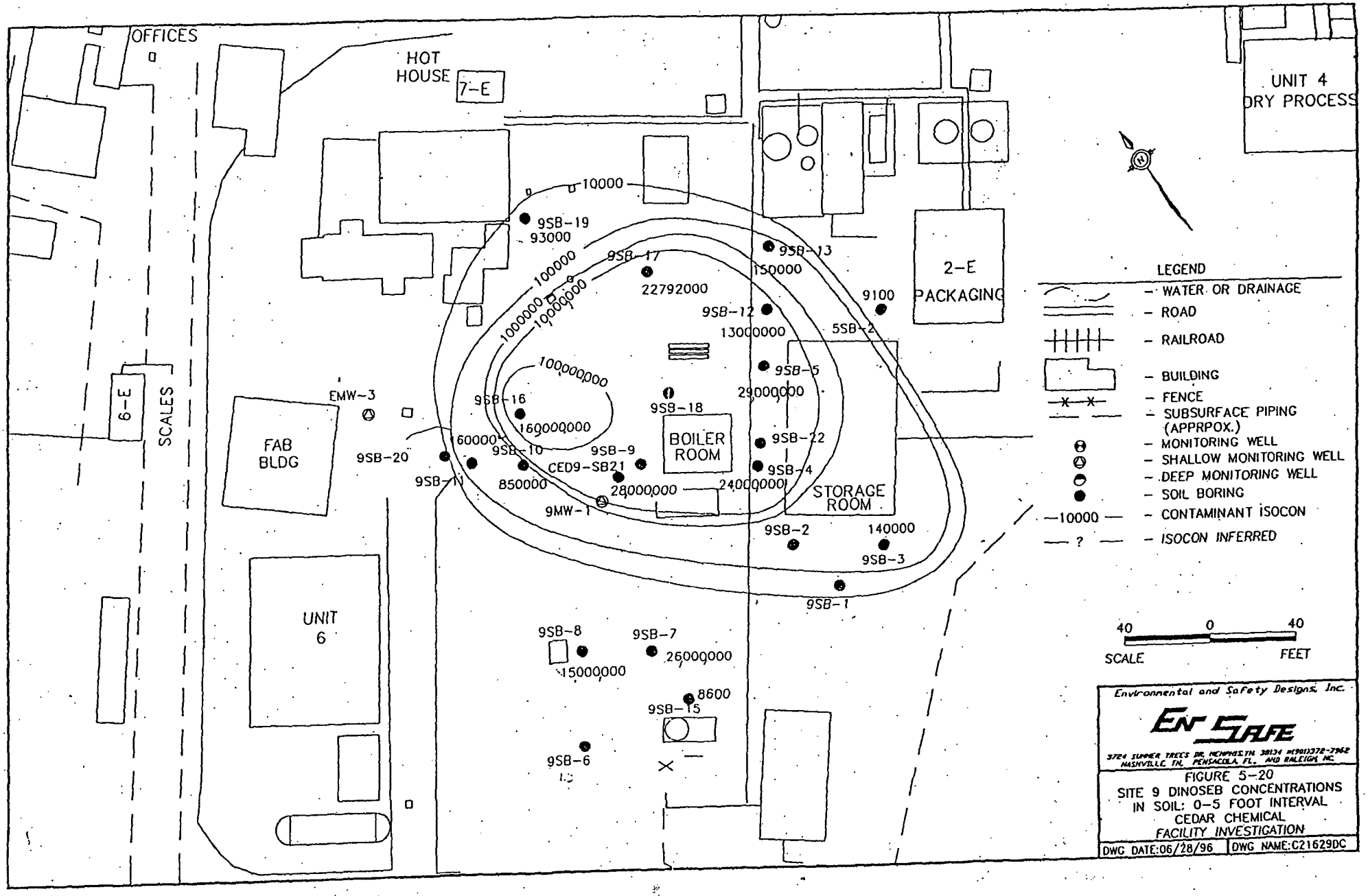
Notes:
U Not detected above PQLs

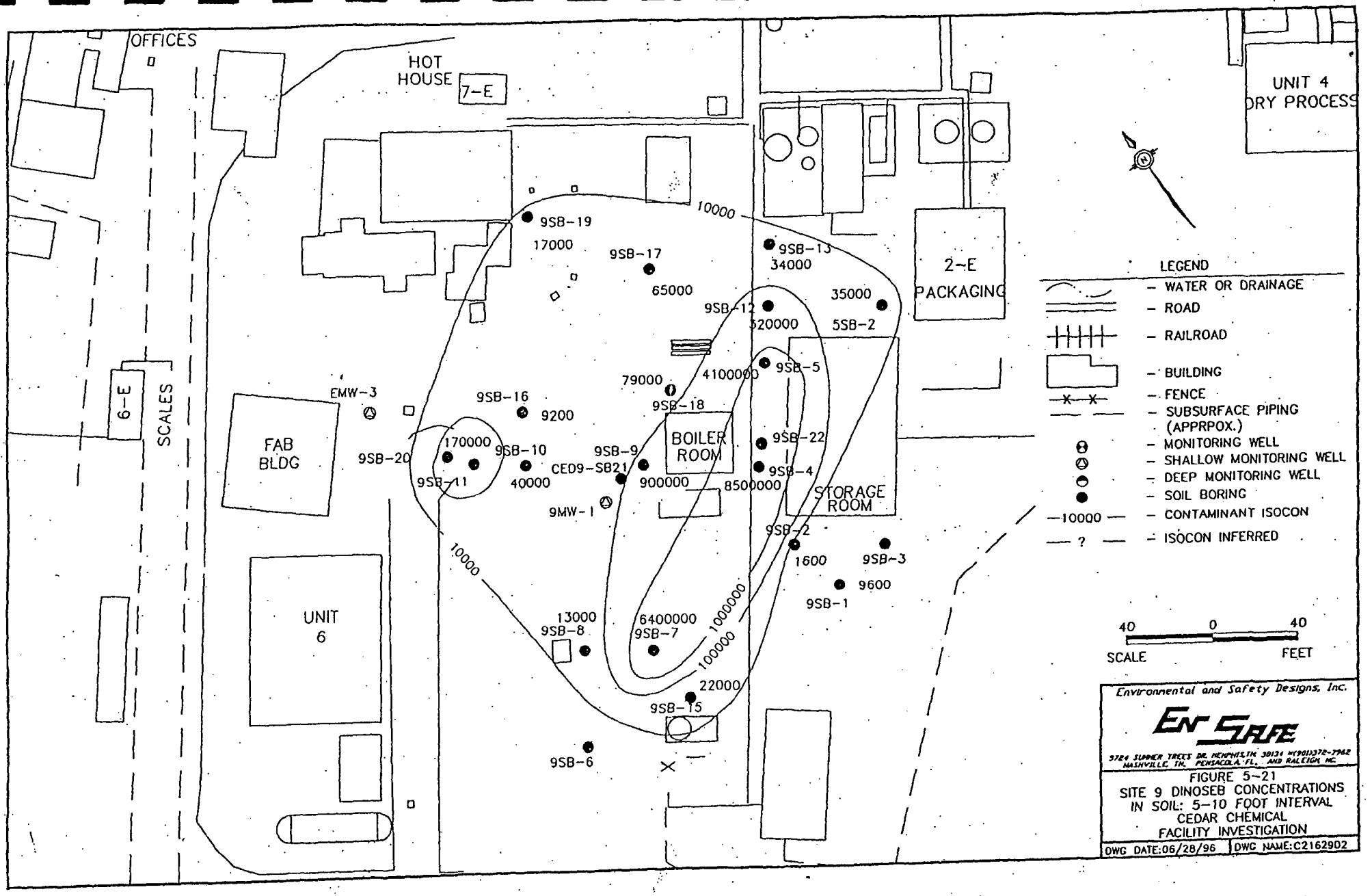
Table 5-18
Cedar Chemical
Phase I Facility Investigation
Site 9 Soil Data

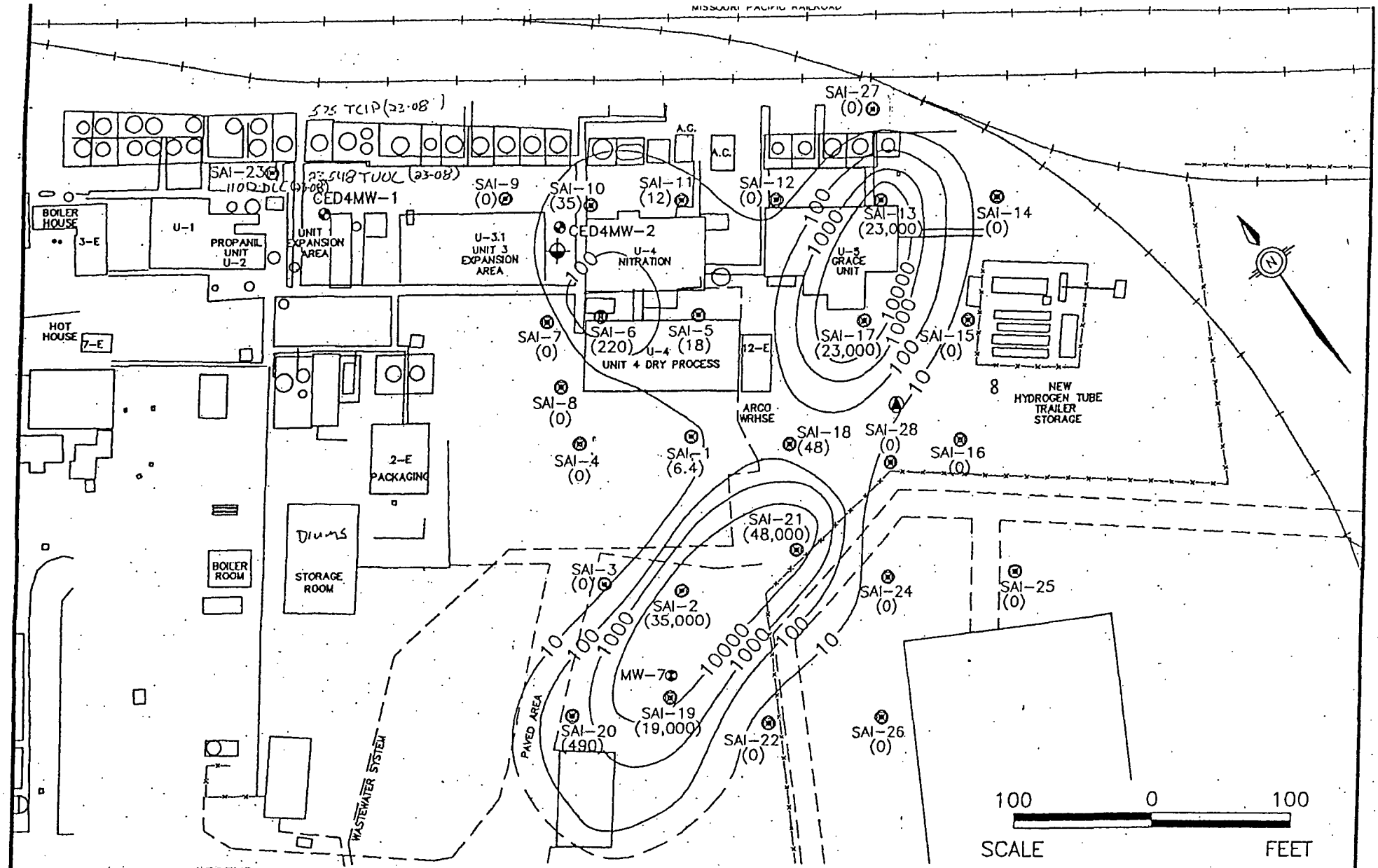
Compound	9SB-3 (0-5')	9SB-3 (5-10')	9SB-15 (0-5')	9SB-15 (5-10')
Volatiles (ppb)				
4-Methyl-2-Pentanone	12	19	U	U
Total Xylenes	4	U	U	U
Acetone	300	1,200	U	U
2-Butanone	22	U	U	U
Semivolatiles (ppb)				
2,4-Dinitrophenol	U	U	U	U
Propanil	11,000	U	U	U
Dinoseb	140,000	U	8,600	22,000
3,4-Dichloroaniline	76,000	130	150	U
Pesticides (ppb)				
4,4'-DDT	U	U	15	U
4,4'-DDD	U	U	24	U
4,4'-DDE	U	U	12	U
Heptachlor	150	U	U	U
Metals (ppm)				
Lead	9	11	8	10
Arsenic	4	7	3	7
Barium	100	150	94	133
Chromium	15	13	11	11

Note:
U Not quantified above PQLs


OFFICES
HOT HOUSE
7-E
UNIT 4
DRY PROCESS
9SB-19
9SB-17
9SB-13
2-E
PACKAGING
9SB-12
10000
5SB-2
9SB-5
1700000
6-E
SCALES
EMW-3
9SB-16
9SB-18
1000000
270000
9SB-22
FAB
BLDG
500
9SB-20
9SB-10
9SB-9
BOILER
ROOM
CED9-SB21
9SB-4
550000
9SB-11
42000
STORAGE
ROOM
9MW-1
9SB-2
9SB-3
100000
UNIT
6
360000
9SB-8
9SB-7
9SB-1
9SB-15
9SB-6
LEGEND
– WATER OR DRAINAGE
– ROAD
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPING (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITORING WELL
– DEEP MONITORING WELL
– SOIL BORING
–10000— – CONTAMINANT ISOCON
— ? — – ISOCON INFERRED
40 0 40
SCALE FEET
Environmental and Safety Designs, Inc.
EN SAFE
5724 SUMMER TREES DR. MEMPHIS,TN 38134 (901)372-7962
NASHVILLE TN. PENSACOLA FL. AND RALEIGH NC.
FIGURE 5-22
SITE 9 DINOSEB CONCENTRATIONS
IN SOIL: 10-15 FOOT INTERVAL
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C21629D3


OFFICES
HOT HOUSE
7-E
UNIT 4
DRY PROCESS
2-E
PACKAGING
6-E
SCALES
FAB BLDG
UNIT 6
BOILER ROOM
STORAGE ROOM
EMW-3
9SB-19
93000
9SB-17
22792000
9SB-13
150000
9100
5SB-2
9SB-12
13000000
9SB-5
29000000
9SB-18
9SB-16
160000000
9SB-20
160000
9SB-10
9SB-9
CED9-SB21
850000
28000000
240000000
9SB-22
9SB-4
9MW-1
9SB-2
140000
9SB-3
9SB-1
9SB-8
9SB-7
26000000
15000000
8600
9SB-15
9SB-6
10000
100000
1000000
10000000
100000000
LEGEND
– WATER OR DRAINAGE
– ROAD
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPING (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITORING WELL
– DEEP MONITORING WELL
– SOIL BORING
—10000— – CONTAMINANT ISOCON
— ? — – ISOCON INFERRED
40 0 40
SCALE FEET
Environmental and Safety Designs, Inc.
ENSAFE
3724 SUMMER TREES DR. MEMPHIS, TN 38134 (901)372-7962
NASHVILLE, TN, PENSACOLA, FL., AND RALEIGH, NC.
FIGURE 5-20
SITE 9 DINOSEB CONCENTRATIONS IN SOIL: 0-5 FOOT INTERVAL
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C216290C


OFFICES
HOT HOUSE
7-E
UNIT 4
DRY PROCESS
2-E PACKAGING
6-E
SCALES
FAB BLDG
UNIT 6
BOILER ROOM
STORAGE ROOM
9SB-19
17000
9SB-17
65000
9SB-13
34000
35000
9SB-12
520000
5SB-2
79000
4100000
9SB-5
EMW-3
9SB-16
9200
9SB-18
9SB-20
170000
9SB-10
40000
9SB-9
CED9-SB21
900000
8500000
9SB-22
9SB-4
9SB-11
9MW-1
9SB-2
1600
9SB-3
9600
9SB-1
13000
9SB-8
6400000
9SB-7
22000
9SB-15
9SB-6
10000
100000
1000000
LEGEND
– WATER OR DRAINAGE
– ROAD
– RAILROAD
– BUILDING
– FENCE
– SUBSURFACE PIPING (APPRPOX.)
– MONITORING WELL
– SHALLOW MONITORING WELL
– DEEP MONITORING WELL
– SOIL BORING
—10000— – CONTAMINANT ISOCON
— ? — – ISOCON INFERRED
40 0 40
SCALE FEET
Environmental and Safety Designs, Inc.
EnSafe
5724 SUMMER TREES DR. MEMPHIS,TN 38134 (901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.
FIGURE 5-21
SITE 9 DINOSEB CONCENTRATIONS IN SOIL: 5-10 FOOT INTERVAL
CEDAR CHEMICAL
FACILITY INVESTIGATION
DWG DATE:06/28/96
DWG NAME:C2162902



LEGEND

- GEOPROBE BORING
- MW MONITORING WELL
- PROPOSED SHALLOW MONITORING WELL
- PROPOSED DEEP MONITORING WELL
- PROPOSED INTERMEDIATE MONITORING WELL

Environmental and Safety Designs, Inc.

EnSafe (SM)

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 ☎(901)372-7962
NASHVILLE, TN. PENSACOLA, FL. AND RALEIGH, NC.

FIGURE 1
SOURCE AREA INVESTIGATION BORINGS AND 1,2 DICHLOROETHANE CONCENTRATIONS
CEDAR CHEMICAL
FACILITY INVESTIGATION

DWG DATE: 02/02/96 | DWG NAME: CEDARAR3

Table 5
Source Area Investigation
Contract Laboratory Split Soil Samples
Semivolatile Organic Compounds and Pesticides (results in µg/kg)

Detected Compound	Sample ID				
	2-SB14-05	2-SB15-01	2-SB15-05	3-SB1-03	3-SB1-06
Semivolatile Organic Compounds					
Dinoseb	U	U	U	180,000	630
Pesticides					
Aldrin	U	11	16	U	U
Dieldrin	U	U	9.5	U	U
4,4'-DDE	U	11	U	U	U
4,4'-DDD	U	15	U	U	U
4,4'-DDT	U	20	11	U	U
Endrin	U	7	U	U	U
Endosulfan Sulfate	U	U	17	U	U
Endrin keytone	U	U	6.4	U	U
Methoxychlor	U	55	U	U	U

Note:
U = Undetected

Several chlorinated pesticides were detected in both samples collected from this boring. The compounds detected in samples 2-SB15-1 and 2-SB15-5 are fairly consistent with those observed in previous Site 2 soil samples. Results for these samples are presented in Table 5.

Site 3 Samples

During Phase II of the Facility Investigation, lithologic borings were installed across the site to assess the alluvial clay. Yellow-stained soil was observed during the installation of lithologic boring CED-LB6 at Site 3. This boring was installed between the two stormwater ditches west of the Cedar warehouse. When the staining was observed, three samples were submitted for SVOC analysis. Phase II samples 003-S-LB06-02 (2 to 4 feet bgs), 003-S-LB06-03 (4 to

Table 4
Source Area Investigation
Contract Laboratory Split Soil Samples
Chlorinated Pesticides (results in µg/kg)

Detected Componnd	Sample ID					
	SAI-5-02	SAI-6-11	SAI-6-15	SAI-9-07	SAI-9-14	SAI-23-08
γ-BHC (Lindane)	4.7	U	U	U	U	30
Endrin	U	U	U	U	U	10
Endosulfan II	U	U	U	U	U	16
Methoxychlor	U	U	U	U	U	470
Endrin aldehyde	U	U	U	U	U	15
Endrin keytone	10	U	U	U	U	34

Note:
U = Undetected

During the third phase of the investigation, one soil sample (2-SB14-05) was collected adjacent to well CED2-MW7 from 8 to 10 feet bgs to confirm whether the methoxychlor was detected in soil during the installation of this well. The sample was analyzed for SVOCs and pesticides. No detectable concentrations of SVOCs or pesticides were observed in this sample. The results for this sample are provided in Table 5.

The remaining Site 2 samples were collected approximately 100 feet northwest of monitoring well CED2-MW3. Parallel, linear patches of stressed vegetation have been observed across Site 2 and extending beyond the suspected boundaries of the former waste ponds. One Phase III soil boring (SB 15) was installed and sampled within an area of stressed vegetation. Sample 2-SB15-1 was collected from 0 to 2 feet bgs, and sample 2-SB15-5 was collected from 8 to 10 feet bgs to determine if the stressed vegetation outside the fenced area results from Site 2 contaminants. These samples were analyzed for SVOCs and pesticides.

Table 3
Source Area Investigation
Contract Laboratory Split Soil Samples
Semivolatile Organic Compounds (results in µg/kg)

Detected Compound	Sample ID							
	SAI-2-15	SAI-5-02	SAI-9-07	SAI-9-14	SAI-11-02	SAI-11-07	SAI-14-04	SAI-23-08
Benzoic Acid	U	U	U	U	U	U	U	500
4-Chloroaniline	U	U	U	U	U	U	U	1,300
1,2-Dichlorobenzene	U	U	U	U	U	U	U	4,500
3,4-Dichloroaniline	U	2,800	U	U	530	U	U	51,000
Dinoseb	U	61,000	51,000	890	50,000	12,000	990	91,000
Propanil	U	U	U	U	U	U	U	19,000

Note:
U = Undetected

Table 2
Source Area Investigation
Contract Laboratory Split Soil Samples
Volatile Organic Compounds (results in µg/kg)

	Sample ID									
Detected Compound	SAI-1-02	SAI-1-17	SAI-12-01	SAI-23-08	SAI-24-06	SAI-24-15	SAI-25-07	SAI-25-15	SAI-26-07	SAI-26-15
Acetone	U		50	5,600	U	U	41	U	U	U
Benzene	U	U	U	220	U	U	18	U	U	U
Bromodichloromethane	U	U	U	17	U	U	U	U	U	U
Bromoform	U	U	U	100	U	U	U	U	U	U
2-Butanone	29	U	U	150	U	U	U	U	U	U
Chlorobenzene	U	U	U	37	U	U	U	U	U	U
Chloroform	U	U	U	160	U	U	U	U	U	U
Dibromochloromethane	U	U	U	74	U	U	U	U	U	U
1,2-Dichlorobenzene	U	U	U	3,400	U	U	U	U	U	U
1,4-Dichlorobenzene	U	U	U	56	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	1,100	U	U	U	U	U	U
Ethylebenzene	U	U	U	1,800	U	U	U	U	U	U
2-Hexanone	U	U	U	14	U	U	U	U	U	U
Methylene Chloride	54	U	U	40	26	U	56	29	U	35
Styrene	U	U	U	180	U	U	U	U	U	U
Xylene (total)	U	U	U	4,700	U	U	U	U	U	U
o-Xylene	U	U	U	5,900	U	U	U	U	U	U

Note:
U = Undetected

Table 1
Field Screening Results
for 1,2-Dichloroethane in Soil

Sample Number	Results (µg/kg)	Sample Interval (feet)	Collection Date
SAI-17-15	23,000	28-30	10/19/95
SAI-18-07	0.44	12-14	10/16/95
SAI-18-15	48	28-30	10/16/95
SAI-19-07	260	12-14	10/13/95
SAI-19-15	19,000	28-30	10/11/95
SAI-20-07	<5,000	12-14	10/16/95
SAI-20-15	490	28-30	10/16/95
SAI-21-07	<5,000	12-14	10/18/95
SAI-21-14	48,000	26-28	10/18/95
SAI-22-10	<5,000	18-20	10/19/95
SAI-22-17	<5,000	32-34	10/19/95
SAI-23-06	<5,000	10-12	10/19/95
SAI-24-06	<5,000	10-12	11/07/95
SAI-24-15	<5,000	28-30	11/07/95
SAI-25-07	<5,000	12-14	11/08/95
SAI-25-15	<5,000	28-30	11/08/95
SAI-26-07	<5,000	12-14	11/08/95
SAI-26-15	<5,000	28-30	11/08/95
SAI-27-02	<5,000	12-14	11/08/95
SAI-27-15	<5,000	28-30	11/08/95
SAI-28-07	<5,000	12-14	11/08/95
SAI-28-16	<5,000	30-32	11/08/95
SAI-28-16	<5,000	30-32	11/08/95

Notes:
<20 ppb — Initially, soil samples were analyzed at a 1 times dilution with 20 ppb being the calculated quantitation limit of the field GC.

<5000 ppb — Later samples were analyzed only at a 1000 times dilution for a calculated quantitation limit of 5000 ppb or 5 ppm.

Table 1
Field Screening Results
for 1,2-Dichloroethane in Soil

Sample Number	Results (µg/kg)	Sample Interval (feet)	Collection Date
SAI-3-15	<20	28-30	10/13/95
SAI-4-07	<20	12-14	10/12/95
SAI-4-15	<20	28-30	10/12/95
SAI-5-07	110	12-14	10/12/95
SAI-5-15	18	28-30	10/12/95
SAI-6-07	21	12-14	10/16/95
SAI-6-14	220	26-28	10/16/95
SAI-7-07	<20	12-14	10/16/95
SAI-7-15	<20	28-30	10/16/95
SAI-8-07	<20	12-14	10/16/95
SAI-8-15	<20	28-30	10/16/95
SAI-9-05	<5,000	8-10	10/19/95
SAI-9-09	<5,000	16-18	10/19/95
SAI-10-07	12	12-14	10/16/95
SAI-10-15	35	28-30	10/16/95
SAI-11-07	2.8	12-14	10/16/95
SAI-11-15	12	28-30	10/16/95
SAI-12-15	<5,000	28-30	10/19/95
SAI-12-07	<5,000	12-14	10/19/95
SAI-13-07	23,000	12-14	10/19/95
SAI-13-15	<5	28-30	10/19/95
SAI-14-03	<5,000	4-6	10/19/95
SAI-14-15	<5,000	28-30	10/19/95
SAI-15-07	<5,000	12-14	10/19/95
SAI-15-15	<5,000	28-30	10/19/95
SAI-16-07	<5,000	12-14	10/19/95
SAI-16-15	<5,000	28-30	10/19/95
SAI-17-07	<5,000	12-14	10/19/95

compound. Table 1 presents the source area soil screening results. Tables 2, 3 and 4 present the results of the split samples submitted to the contract laboratory.

MISCELLANEOUS SOIL SAMPLES

Miscellaneous soil samples were collected from certain areas across the site to fill data gaps from the second phase of the investigation. The following paragraphs discuss the rationale and results for these samples.

Site 2 Samples

Three samples associated with Site 2 were collected. One sample was collected adjacent to monitoring well CED2-MW7. This well is located near the corner of Highway 242 and Industrial Park Road, by the Cedar Chemical main office. During the installation of well CED2-MW7, methoxychlor, a Site 2 contaminant, was detected in concentrations as high as 280,000 ppb from 5 to 10 feet bgs. However, samples collected during the Phase II investigation of Site 2 indicate that the methoxychlor contamination is confined to the boundaries of the former waste ponds. Furthermore, well CED2-MW7 is located approximately 300 feet from the former waste ponds and outside the fenced perimeter of the plant.

Table 1
Field Screening Results
for 1,2-Dichloroethane in Soil

Sample Number	Results (µg/kg)	Sample Interval (feet)	Collection Date
SAI-1-01	<20	0-2	10/12/95
SAI-1-02	<20	2-4	10/12/95
SAI-1-17	6.4	32-34	10/12/95
SAI-2-03	120	4-6	10/13/95
SAI-2-04	64	6-8	10/12/95
SAI-2-13	35,000	24-26	10/13/95
SAI-2-14	31,000	26-28	10/12/95
SAI-3-07	<20	12-14	10/13/95

Figure 4[1,2]
Conceptual Site Model for Cedar Chemical Corporation

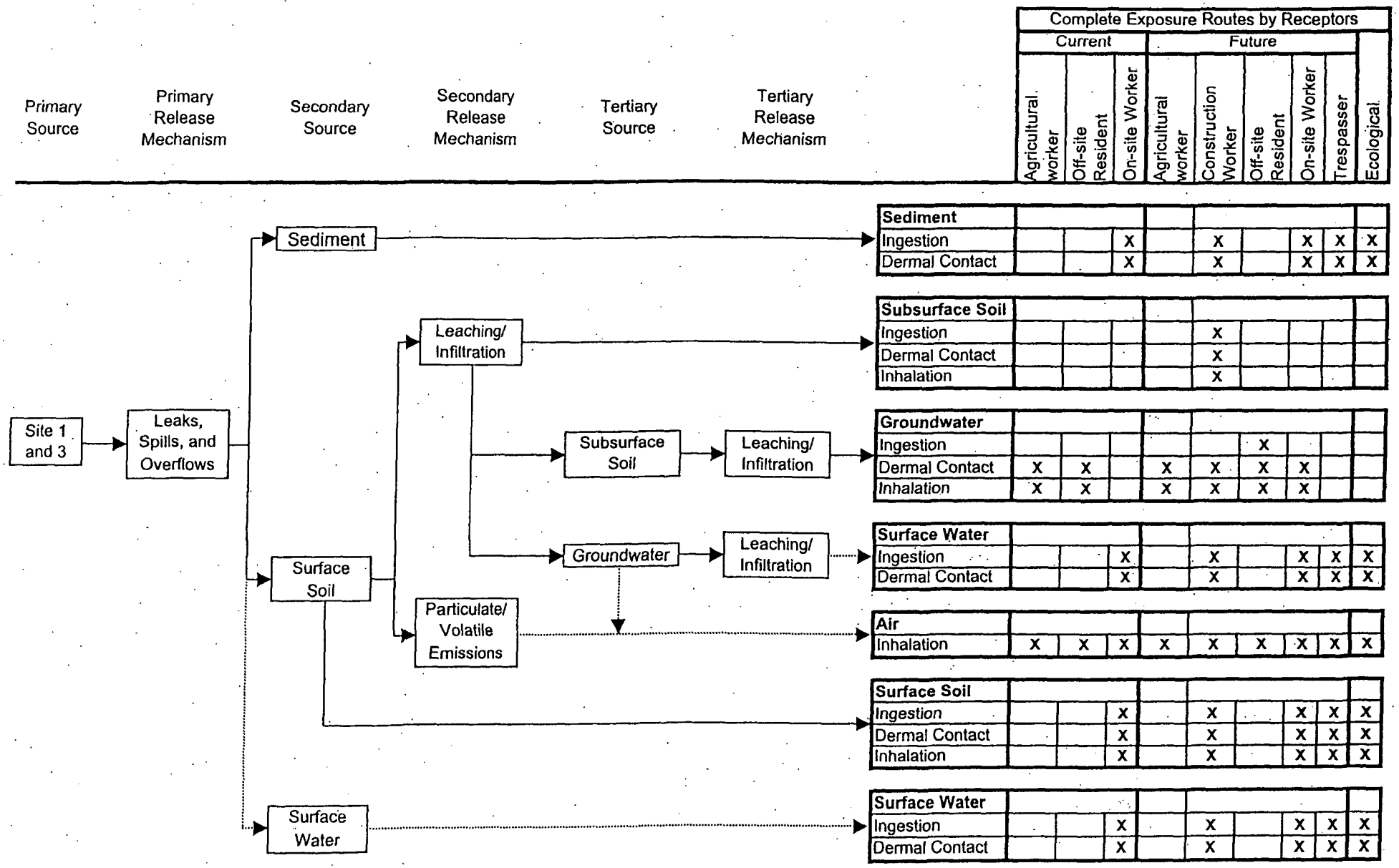


Figure 4[1,2]

Conceptual Site Model for Cedar Chemical Corporation

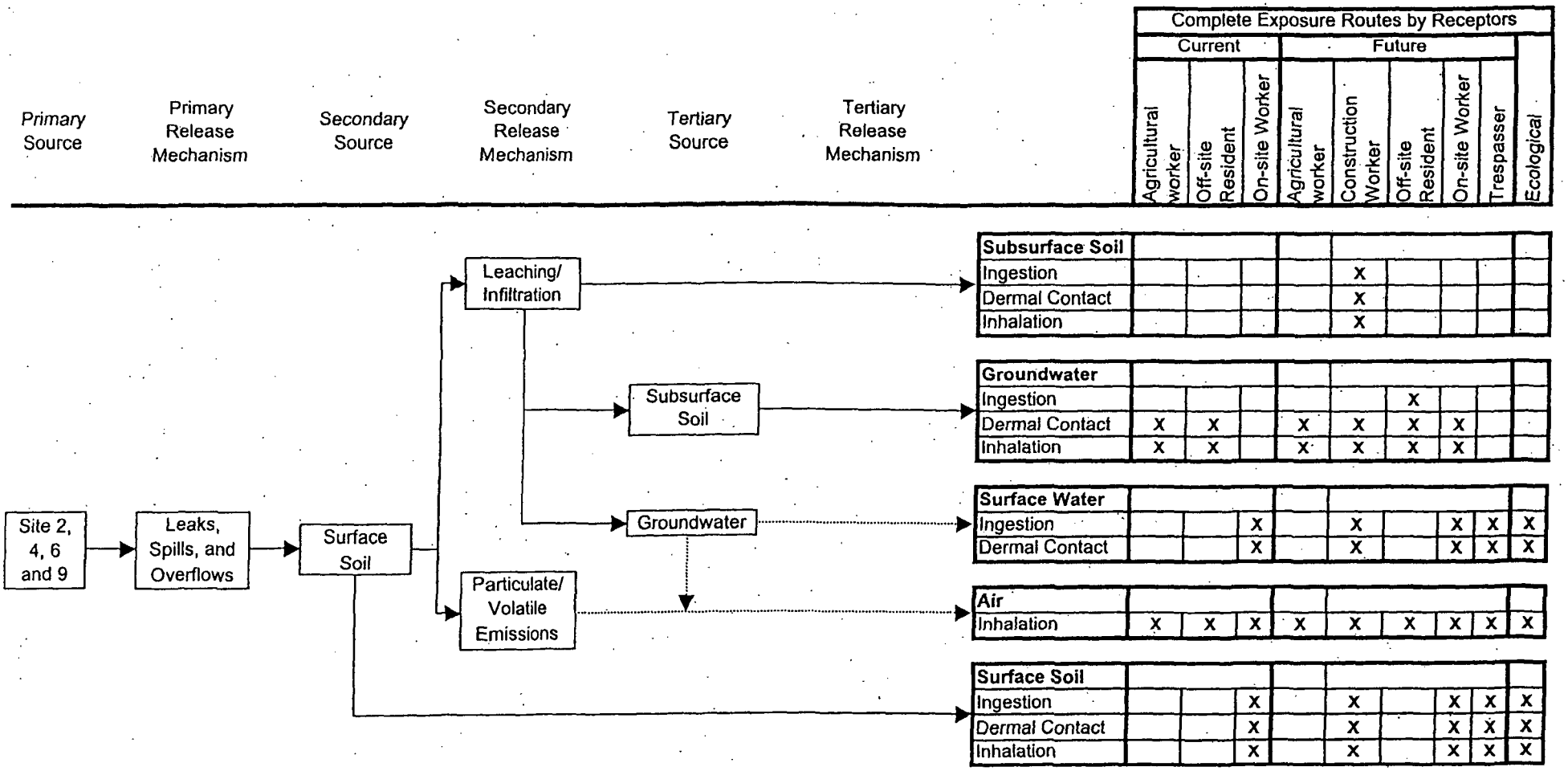
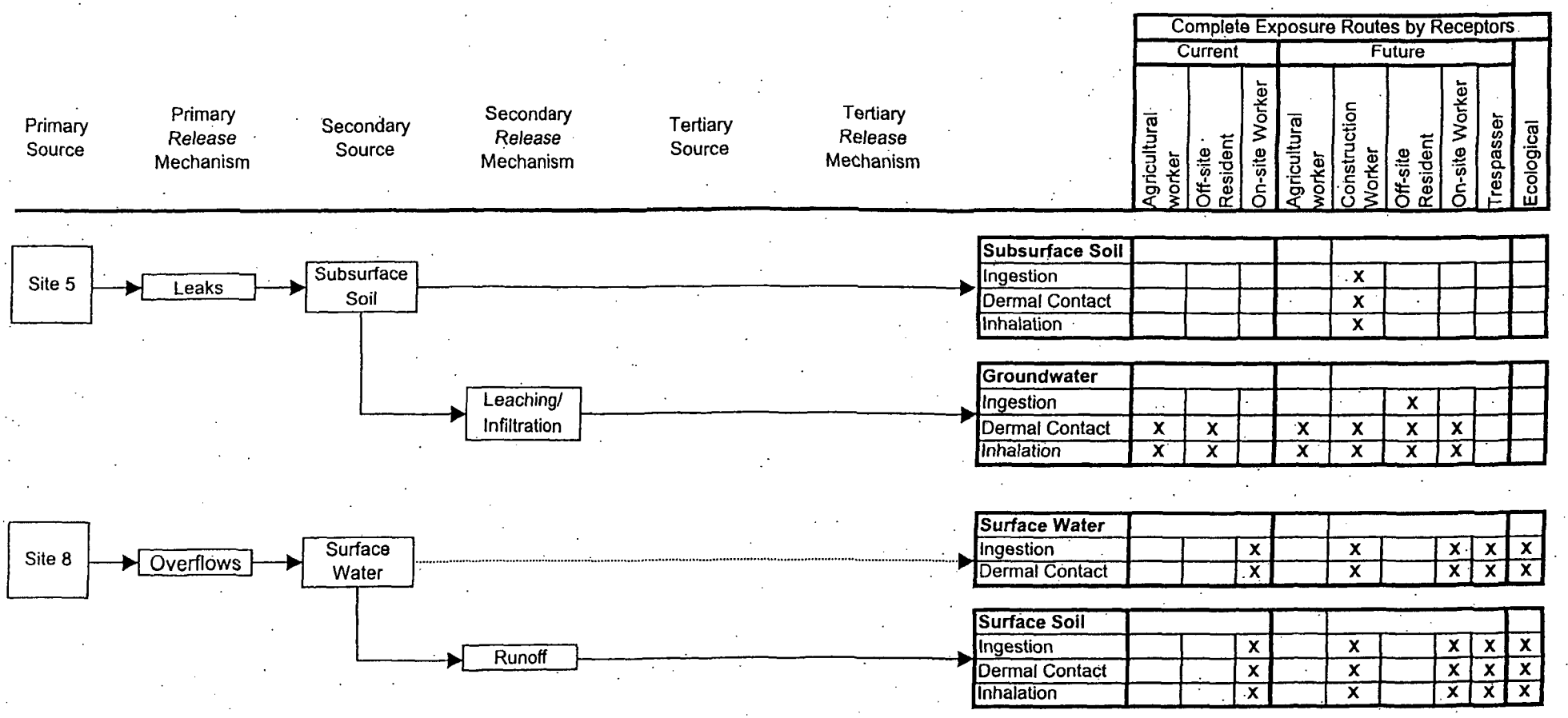


Figure 4[1,2]

Conceptual Site Model for Cedar Chemical Corporation



[1] The solid line represents the media available data indicate are contaminated.

[2] The dashed line represents media that may be contaminated, but data is not available to confirm.

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK

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In re:	Chapter 11	
CEDAR CHEMICAL CORPORATION and VICKSBURG CHEMICAL COMPANY,	Case Nos.	02-11039 (SMB) and 02-11040 (SMB)
Debtors.	Jointly Administered	

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23349

STIPULATION AND ORDER AUTHORIZING ABANDONMENT OF WEST HELENA MANUFACTURING FACILITY AND VICKSBURG MANUFACTURING FACILITY AND GRANTING RELATED RELIEF

(A&F No. 031)

WHEREAS on March 8, 2002 (the "**Petition Date**"), Cedar Chemical Corporation ("**Cedar**") and Vicksburg Chemical Company ("**Vicksburg**") (collectively the "**Debtors**") each filed a voluntary petition for relief under Chapter 11 of Title 11 of the United States Code (the "**Bankruptcy Code**") with the United States Bankruptcy Court for the Southern District of New York (the "**Court**");

WHEREAS Cedar owns certain lots, pieces, tracts or parcels of land located at or near 49 Phillips Road 311 in West Helena, Arkansas, more particularly described in **Exhibit A** hereto, along with all buildings, structures, improvements, facilities, equipment, fixtures, and other tangible chattels and articles of tangible personal property thereon, therein or thereunder except for such equipment and the like as have been leased by Vicksburg or otherwise owned by other parties (the "**West Helena Facility**");

WHEREAS Vicksburg owns certain lots, pieces, tracts or parcels of land located at or near 4280 Rifle Range Road in Vicksburg, Mississippi, more particularly described in **Exhibit B** hereto, along with all buildings, structures, improvements, facilities, equipment, fixtures, and other tangible chattels and articles of tangible personal property thereon, therein or thereunder except for such equipment and the like as have been leased by Vicksburg or otherwise owned by other parties (the "**Vicksburg Facility**");

WHEREAS on August 29, 2002 the Debtors filed a motion (the "**Motion**") pursuant to sections 105(a) and 554(a) of the Bankruptcy Code seeking an order authorizing the abandonment by Cedar of the West Helena Facility and the abandonment by Vicksburg of the Vicksburg Facility and granting related relief;

WHEREAS the Court signed an order dated September 4, 2002 scheduling a hearing on the Motion (the "**Scheduling Order**");

WHEREAS a statement in support of the Motion was filed by JPMorgan Chase Bank, as agent (the "**Agent**") to the pre-petition secured lenders (the "**Secured Lenders**"), as listed under a certain Credit Agreement dated as of November 3, 1995, as amended, supplemented or otherwise modified, among Cedar, the Secured Lenders and the Agent (to avoid doubt, "Secured Lenders" does not include the Debtors, any affiliate of the Debtors, Trans Resources Inc., and Arie Genger);

WHEREAS the Arkansas Department of Environmental Quality (the "**ADEQ**"), the Mississippi Commission on Environmental Quality and the Mississippi Department of Environmental Quality (collectively, the "**MDEQ**") and the United States on behalf of the Environmental Protection Agency (the "**EPA**") (together with the ADEQ and the MDEQ the "**Agencies**" and each individually an "**Agency**"), and Harcros Chemicals Inc. each filed objections to the Motion;

WHEREAS the Agent and the Debtors filed a joint reply to the objections of the Agencies;

WHEREAS on or about September 26, 2002, the MDEQ issued Order No. 4486-02 purporting, among other things, to enjoin Vicksburg from transferring the Vicksburg Facility to another party without complying with Debtors' environmental permits.

WHEREAS good and sufficient notice of the Motion has been provided by the Debtors in accordance with the terms of the Scheduling Order;

WHEREAS a hearing on the Motion was held on September 25, 2002; and an evidentiary hearing on the Motion was held on October 7, 2002 (the "**Evidentiary Hearing**");

WHEREAS the West Helena Facility and the Vicksburg Facility (collectively, the "Facilities") are of inconsequential value and benefit to the estates of the Debtors and that such estates lack sufficient unencumbered assets with which to continue the maintenance, management and oversight of the Facilities;

WHEREAS, the Debtors have cooperated with the Agencies in the transition of the Facilities prior to their proposed abandonment;

WHEREAS the Debtors, the Agencies and the Agent (on behalf of the Secured Lenders) agree to compromise and resolve the various objections to the Motion as provided herein;

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration receipt of which is hereby acknowledged;

IT IS HEREBY STIPULATED and agreed to by and between the parties, subject to approval by the Court, as follows, and upon approval by the Court, it is hereby ORDERED that:

1. The Court has jurisdiction to hear and consider the Motion pursuant to 28 U.S.C. § 1334 and 28 U.S.C. § 157 and to grant the relief requested therein.

2. This is a core proceeding under 28 U.S.C. § 157(b).

3. Good and sufficient notice of the Motion, the proposed abandonment of the Facilities and of the hearings scheduled thereon has been provided and any other requirement for notice be, and hereby is, dispensed with.

4. The Motion, as modified and conditioned herein, is hereby granted.

5. The Facilities are of inconsequential value and benefit to the estates of the Debtors and such estates lack sufficient unencumbered assets with which to continue the maintenance, management, and oversight of the Facilities.

6. All requirements of section 554(a) of the Bankruptcy Code for the abandonment of the Facilities have been satisfied and sufficient circumstances exist in these cases to justify the approval of such abandonment, as conditioned herein.

7. The Facilities are hereby abandoned to the pre-petition Debtors effective 11:59 p.m. on October 14, 2002 (the "**Effective Time**"). The West Helena Facility shall be deemed abandoned to the Cedar non-bankruptcy estate and the Vicksburg Facility shall be deemed abandoned to the Vicksburg non-bankruptcy estate.

8. The Debtors and their respective officers, employees, directors, the pre-petition Debtors' officers, employees and directors and Marotta Gund Budd & Dzera LLC and any of its employees (collectively, "MGB") shall have no obligation for the management or operation of the Facilities subsequent to the Effective Time.

9. The Debtors and the officers, employees, agents and directors of the Debtors and pre-petition Debtors (but solely in their capacity as officers, employees, agents or directors of the Debtors or

pre-petition Debtors) shall be free of any liability for any occurrence or event with respect to (i) the Vicksburg Facility occurring subsequent to the Effective Time and (ii) the West Helena Facility occurring subsequent to 5:00 p.m. Eastern Standard Time on October 18, 2002 arising from the abandonment.

10. The United States, on behalf of the EPA, covenants not to sue the officers, employees, and directors of the Debtors and pre-petition Debtors (but solely in their capacity as officers, employees, or directors of the Debtors or pre-petition Debtors) or MGB for civil liability with respect to the Facilities for any cause of action or other claim for relief asserting environmental liability pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. § 9601 et seq.), the Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.), the Clean Water Act (42 U.S.C. § 1251 et seq.) or any state statute, including any regulations promulgated thereunder, for any occurrence or event with respect to the Facilities occurring subsequent to the Effective Time, provided however that this covenant not to sue shall not apply with respect to any affirmative acts of operation or disposal by such persons with respect to the Facilities occurring after the abandonment authorized herein. This covenant not to sue does not pertain to any matters other than those specified in this paragraph.

11. In consideration for the Agent's agreement to allow the Debtors to use an additional amount of cash collateral up to $10,000 to continue the current environmental monitoring and oversight of the West Helena Facility until 5:00 pm Eastern Standard Time on Friday, October 18, 2002 (after which time the ADEQ or its agent will enter upon the site and assure continued environmental monitoring and oversight of the West Helena Facility), the ADEQ hereby and forever discharges, releases and covenants not to sue, to take any other civil judicial or administrative action (including for injunctive relief) against, or to seek any reimbursement of past or future response costs against, the Agent or any of the Secured Lenders in respect

of any hazardous substances, pollutants, contaminants or other environmental conditions, present or existing on or under, or emanating from, the West Helena Facility from the beginning or time until 5:00 pm Eastern Standard Time on Friday, October 18, 2002, including, without limitation, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. Sections 9601 et seq.), the Resource Conservation and Recovery Act (42 U.S.C. Sections 6901 et seq.), the Clean Air Act (42 U.S.C. Sections 7401 et seq.), the Clean Water Act (42 U.S.C. Sections 1251 et seq.), and Titles 8 and 15 of the Arkansas Code, in each case as amended and including any regulations promulgated thereunder. This Stipulation and Order settles and resolves, without the admission or adjudication of any issue of fact or law, the Agent's and each of the Secured Lenders' potential liability to the ADEQ, with respect to all matters addressed herein, and the Agent and each of the Secured Lenders shall be entitled to protection against contribution claims to the maximum extent provided pursuant to 42 U.S.C. Section 9613(f)(2).

12. After the Effective Time, the EPA and ADEQ, and their agents, shall at all times have the right to access the West Helena Facility for purposes of continuing the operation of the ponds and wastewater systems, as the Agencies deem appropriate, conducting investigations relating to contamination at or near the West Helena Facility, obtaining samples, assessing the need for, planning, or implementing additional response measures, or performing any and all removal or remedial activities, corrective actions or response measures. Debtors agree to request that ENSAFE provide ADEQ copies of any documents generated, collected or otherwise in the possession of ENSAFE that relate to the West Helena Facility

13. The Debtors are authorized to cancel any insurance policies pertaining to the Facilities as of the Effective Time, except to the extent the premiums for such insurance coverage have been paid in full and the Debtors would not be entitled to a refund, if such insurance coverage was canceled.

14. After the Effective Time, the EPA and MDEQ, and their agents, shall at all times have the right to access the Vicksburg Facility for purposes of continuing the operation of the ponds and wastewater systems, as the Agencies deem appropriate, conducting investigations relating to contamination at or near the Vicksburg Facility, obtaining samples, assessing the need for, planning, or implementing additional response measures, or performing any and all removal or remedial activities, corrective actions or response measures. This provision shall not act in derogation of Miss. Code Ann. § 49-17-21 or pre-existing state permit conditions with regard to access.

15. With the consent of the Secured Lenders, all mortgages, liens and other security interests held by the Secured Lenders in the Facilities or any part thereof, including the land and any buildings, structures, improvements, facilities, equipment, fixtures, and other tangible chattels and articles of tangible personal property thereon, therein or thereunder (the "**Secured Lender Liens**"), shall be, and are hereby unconditionally and irrevocably deemed released, discharged and terminated as of the Effective Time and the abandonment of the West Helena Facility to the Cedar non-bankruptcy estate and the abandonment of the Vicksburg Facility to the Vicksburg non-bankruptcy estate shall, in each case, be free and clear of the Secured Lender Liens, and this Stipulation and Order shall be binding upon and govern the acts of all entities, including, without limitation, all filing agents, filing officers, title agents, title companies, administrative agencies, governmental departments, secretaries of state, federal, state and local officials and all other persons and entities who may be required, by operation of law, the duties of their office or contract, to accept, file, register or otherwise record or release any documents or instruments.

16. Upon written request by the ADEQ, the Cedar non-bankruptcy estate shall convey title to the West Helena Facility or parts thereof to any entity identified by the ADEQ, and upon written request

by the MDEQ, the Vicksburg non-bankruptcy estate shall convey title to the Vicksburg Facility or parts thereof to any entity identified by the MDEQ. Any consideration received for the transfer of the respective Facilities or parts thereof shall be applied to the environmental cleanup of the respective Facilities and shall be treated as a contribution by the Debtors to such cleanup. Any entity to whom the Facilities or any parts thereof are transferred shall be given a copy of the Stipulation and Order and shall be bound by its terms.

17. Absent an objection, the leases for personal property located at the Facilities (the "Facility Leases"), a schedule of certain of such leases is annexed hereto as Schedule I, shall be deemed rejected pursuant to section 365(a) of the Bankruptcy Code, as of one day subsequent to the date that the Debtors provide the lessors under the Facility Leases (the "Lessors") with notice by overnight delivery of such proposed rejection. Such notice also shall provide (i) for a ten-day period within which such Lessors may file an objection to such rejection and (ii) that the Lessors should immediately contact Mr. Philip Gund, the Debtors' "Restructuring Officer" or a person designated by Mr. Gund to arrange for a pick-up of the personal property under the Facility Leases.

18. MDEQ, by its agreement to this Stipulation and Order, does not waive any defenses created by Miss. Code Ann. § 11-46-9, nor accept any liabilities not otherwise imposed by operation of law.

19. The Debtors waive and relinquish their interest, if any, in (i) Trustmark National Bank Trust and Asset Management Account No. 35-L903-00-8; (ii) Trust Agreement dated October 6, 1982 between Vertac Chemical Corporation, as Grantor and First National Bank, as Trustee (the "EPA Agreement"); (iii) Trust Agreement dated October 6, 1982 between Vertac Chemical Corporation, as Grantor and First National Bank, as Trustee (the "Mississippi Department of Natural Resources Agreement

"); and (iv) Amendment dated June 27, 1986 to the Mississippi Department of Natural Resources Agreement.

20. Each signatory to this Stipulation and Order certifies that he or she is authorized to enter into the terms and conditions of this Stipulation and Order and to bind legally the party represented by him or her except that the execution of this Stipulation and Order by the Assistant Attorney General is required with respect to the United States.

21. This Stipulation and Order shall be deemed a "**Final Order**" when (i) the time to appeal or seek review, rehearing, reargument or certiorari has expired and no stay of appeal is in effect or petition for review, rehearing, reargument or certiorari proceeding is pending; or (ii) an appeal of this Stipulation and Order has been affirmed and the time for further appeal has expired.

22. As a contribution to the environmental cleanup of the Facilities, the Debtors shall pay $200,000 to the ADEQ and $200,000 to the MDEQ from the "proceeds of any sale by the Debtors of the EPA Registrations" deposited into "Avoidance Realization Account" as provided in paragraph 19 of the "Final Order (i) Authorizing Use of Cash Collateral (ii) Providing for Adequate Protection and (iii) Granting Related Relief dated August 21, 2002 (the "Final Cash Collateral Order"), notwithstanding any provisions in the Final Cash Collateral Order to the contrary, but only to the extent the ADEQ and MDEQ are granted allowed administrative claims in those amounts under section 503(b) of the Bankruptcy Code. The MDEQ and ADEQ shall be entitled to such an administrative priority to the extent that they can demonstrate that such expenses were incurred with respect to the Facilities and were consistent with applicable environmental laws. The ADEQ and MDEQ agree that the Debtors or any chapter 7 trustee in the Debtors' cases will have no administrative expense liability to the MDEQ and ADEQ in excess of

the $200,000 claims provided herein. Solely in connection with the confirmation of a chapter 11 plan, the Agencies agree not to object to a plan on the basis of section 1129(a) (9)(A) of the Bankruptcy Code. The abandonment of the Facilities and payment of $400,000 shall be without prejudice to additional administrative expenses or general unsecured claims of the United States, except to the extent that the United States asserts a claim as an assignee of ADEQ or MDEQ. Nothing in this Stipulation and Order shall waive or prejudice any right of any party to object to additional claims by the EPA on any ground other than a lack of an entitlement to an administrative priority based on the abandonment of the Facilities. The United States may perfect a lien for its costs with respect to the Facilities on the abandoned property to the extent permitted by applicable law.

23. The Debtors are authorized to transfer or otherwise make available all books and records relating to the Vicksburg Facility and/or the West Helena Facility (the "Facility Books and Records") to any Agency making such request without further order of the Court. Subject to further order of the Court, the Debtors shall secure and preserve the Facility Books and Records until such time as they are transferred to an Agency and provide each of the Agencies at least ten (10) days notice of their intention to destroy or discard any of the Facility Books and Records or transfer such Facility Books and Records to one of the Agencies.

24. The Debtors are hereby authorized to execute and deliver any instrument and perform any other act that is necessary in order to effectuate the purposes of this Stipulation and Order.

25. This Court shall retain jurisdiction to hear and determine any matter arising from or relating to this Stipulation and Order.

Dated: October ___, 2002

FOR THE DEBTORS

Yehuda Yoked, President
Cedar Chemical Corporation

Yehuda Yoked, President
Vicksburg Chemical Company

Dated: October ___, 2002

FOR THE AGENT, ON BEHALF OF
THE SECURED LENDERS

_____

[Name and Title]
JPMorgan Chase Bank, as Agent for the Secured Lenders

Except as to paragraph 9, and subject to the approval of the Assistant Attorney General:

Dated: New York, New York
October __, 2002

JAMES B. COMEY
United States Attorney for the
Southern District of New York
Attorney for the United States

Dated: October ___, 2002

By:_____
David J. Kennedy (DK-8307)
Assistant United States Attorney
100 Church Street - 19th Floor
New York, New York 10007
Temp. Tel: (718) 422-5649
Temp. Fax: (718) 422-1789

Except as to paragraph 9:

Dated: Washington, DC
October __, 2002

_____
THOMAS C. SANSONETTI
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044 - 7611

Except as to paragraph 9, and subject to the approval of the Assistant Attorney General:

Dated: Atlanta, Georgia
October __, 2002

Region 4

SUZANNE RUBINI
Assistant Regional Counsel
U.S. Environmental Protection Agency,
61 Forsyth Street, S.E.
Atlanta, Georgia 30303
(404) 562-9674; telefax: (404) 562-9664

Except as to paragraph 9, and subject to the approval of the Assistant Attorney General:

Dated: Dallas, Texas
October __, 2002

MARK A. PEYCKE
Chief, Superfund Branch
Office of Regional Counsel, Region 6
1445 Ross Avenue, Ste. 1200
Dallas, Texas 75202
(214) 665-3159; telefax: (214) 665-6460

Dated: October ___, 2002

FOR THE MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY AND THE MISSISSIPPI COMMISSION ON ENVIRONMENTAL QUALITY

_____

Charles H. Chisolm
Executive Director

Dated: October ___, 2002

_____

Chuck D. Barlow
General Counsel

Dated: October 18, 2002

FOR THE ARKANSAS DEPARTMENT
OF ENVIRONMENTAL QUALITY

Marcus Devine
Director

IT IS SO ORDERED:

Dated: New York, New York
October ___, 2002

Chief United States Bankruptcy Judge

Schedule I
Personal Property Leases of the Debtors at the Facilities

A. West Helena Facility Leases

Equipment	Contact	Account #	Monthly Payment
Fork Lift SN 5AM09021	Grady Jones Co, Inc. 901-365-8830	112725	659.12
Fork Lift	Grady Jones Co, Inc. 901-365-8830	112725	400.00
Fork Lift	Citicorp Del-Lease, Inc. 800-227-6766		1,075.68
Phone System	Avaya Financial Services 800-5276-9876 X7401	S623553	1,385.95
Xerox 5828 Copier sn 2 WU-063639	Xerox Capital Services, LLC	953303484	126.70
Xerox 5828 Copier sn 2 WU-070028	Xerox Capital Services, LLC	958867558	219.30

B. Vicksburg Facility Leases

Equipment	Contact	Account #	Monthly Payment
Locomotive	Birmingham Rail & Locomotive Company		5,000.00
Office F&F	Steelcase Financial Service		1,540.94
2001 Tiago Motor Home	Americal Lease Plans, Inc.		1,238.26
Hyster Forklift Ser# H177B26045Y	NMHG Financial Services		414.00

Equipment	Contact	Account #	Monthly Payment
Hyster Forklift Ser# H177B31403Y	De Lage Landen Financial Services, Inc. 800-736-0220	143257	488.99
Hyster Forklift Ser# H177B31404Y	De Lage Landen Financial Services, Inc. 800-736-0220	143257	488.99

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

IN THE MATTER OF: LIS 02-148

CEDAR CHEMICAL CORPORATION

EMERGENCY ORDER OF THE DIRECTOR

TO: Philip J. Gund, Marotta Gund Budd & Dzera, LLC; Yehuda Yoked, President & CEO, Cedar Chemical Corporation; Joshua J. Angel, Attorney, Angel & Frankel, P.C.

The Director of the Arkansas Department of Environmental Quality (ADEQ) has determined that emergency conditions exist at the Cedar Chemical Corporation (the "site") located at 49 Phillips Road 311in West Helena, Arkansas. Cedar Chemical Corporation has filed bankruptcy and the facility will be closed. The property and buildings are not secure. Hazardous substances and wastes remain onsite and contamination exists on the property. These situations present an imminent threat to the public health and safety and the environment, requiring immediate action by ADEQ.

Therefore, pursuant to authority provided by the Emergency Response Fund Act, Act 452 of 1985, as amended (A.C.A. § 8-7-401 et seq.), the Arkansas Water and Air Pollution Control Act, Act 472 of 1949, as amended, (A.C.A. § 8-4-201 et seq.), A.C.A. § 8-1-202, the Arkansas Hazardous Waste Management Act of 1979, as amended (A.C.A. § 8-7-201), and the regulations promulgated thereunder, the Director makes the following Findings of Fact and orders that the following remedial actions be taken immediately to remedy the emergency conditions.

FINDINGS OF FACT

1. Cedar Chemical Corporation owns property located at 49 Phillips Road 311 in West Helena, Arkansas at which Cedar Chemical Corporation operated a chemical manufacturing facility.

2. On March 8, 2002, Cedar Chemical Corporation filed a voluntary petition for relief under Chapter 11 of Title 11 of the United States Code with the United States Bankruptcy Court for the Southern District of New York.

3. On August 29, 2002, Cedar Chemical Corporation filed a motion with the U.S. Bankruptcy Court of the Southern District of New York to abandon the manufacturing facility located in West Helena, Arkansas.

4. Abandonment is anticipated to be approved no later than 5:00 p.m. October 18, 2002.

5. Site inspections conducted by ADEQ personnel confirm that manufacturing operations at the site have ceased.

6. ADEQ personnel observed numerous containers of chemicals (raw materials, product, and wastes) onsite and visual surfacial contamination.

7. ADEQ personnel observed two onsite laboratories containing a wide variety of hazardous substances. ADEQ personnel found numerous incidences of incompatible materials stored in the laboratories. Acids, bases, oxidizers, and flammable materials were all stored side-by-side in various locations within both laboratories. This situation presents a high potential threat of fire, explosion, emission of potentially toxic gas, and the possibility of runoff contaminating the local community as a result of conventional fire fighting techniques.

8. In previous Orders between ADEQ and Cedar Chemical Corporation, ADEQ had required Cedar Chemical Corporation to conduct an investigation of certain solid waste management units (SWMUs) due to the presence of visible contamination, address non-compliance with applicable regulations for hazardous waste management, and correct related problems with storm water runoff. Background conditions were also evaluated during the investigation. Interim Measures, including removal of old buried wastes have been implemented to control on-going sources of contamination.

9. The investigation concluded significant impacts to surface soils, surface water, and subsurface soils resulted from facility operations consisting of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and metals in concentrations greater than background, at concentrations that may continue to contribute to groundwater

contamination, and at concentrations that may pose an unacceptable risk to humans under various exposure scenarios.

10. Surface soils at the site were visibly stained yellow throughout most of the site history. The yellow color is associated with contamination from the herbicide Dinoseb.

11. The following hazardous substances have been detected in soils at concentrations greater than risk-based screening criteria: Arsenic, Cadmium, Mercury, Aldrin, Dieldrin, Dinoseb, Heptachlor, Methoxychlor, Toxaphene, 3, 4-Dichloroaniline, Propanil, Chloroform, 1, 2-Dichloroethane, Methylene Chloride, and Pentachlorophenol.

12. ADEQ required Cedar Chemical Corporation to conduct a groundwater quality assessment to evaluate the nature and extent of contaminants released from soils to the groundwater. Various pesticides, metals, semi-volatile organic compounds, and volatile organic compounds were determined to have been released from contaminated soils into perched groundwater and the alluvial aquifer.

13. Cedar Chemical Corporation has admitted to ADEQ that approximately 200 drums of an unknown waste material have been disposed onsite by burying the drums underneath the foundation of the maintenance warehouse. This situation represents a high risk for new or continuing releases into both soils and groundwater.

14. More than 20 contaminants have been detected in the groundwater. Groundwater in several locations (on and off-site) has been found to be contaminated with 1, 2-Dichloroethane (DCA). EPA has determined that DCA is a probable human carcinogen. DCA has a published Maximum Contaminant Level (MCL) of 0.005 mg/L for drinking water supplies. DCA has been detected in on-site groundwater at concentrations up to 84 mg/L, or 16,800 times the drinking water MCL.

15. The following hazardous substances have been detected in the groundwater at concentrations greater than risk based screening criteria and/or MCLs: Arsenic, Barium, Cadmium, Chromium, Lead, 4,4'-DDT, Alpha BHC, 1,4-Dichlorobenzene, 2,6-Dinitrotoluene, 3,4-Dichloroaniline, 4-Chloroaniline, Dinoseb, bis(2-Chloroethyl)ether, 1,2-Dichloroethane, 4-Methyl-2-Pentanone, 2-Methylphenol, Acetone, Benzene, Chloroform, Methylene Chloride,

Trichloroethene, 1,1,2-Trichloroethane, 1,2-Dichloropropane, Bromodichloromethane, Bromoform, Chlorobenzene, Dibromochloromethane, and Toluene.

16. Based upon this situation, the Director has determined that an emergency exists and issues the following Order in accordance with A.C.A. § 8-1-202(b) (3).

ORDER OF REMEDIAL ACTION

ADEQ shall ensure that:

17. The site is secured in such that all doors and entry ways are locked to prevent unauthorized entry to the buildings. The perimeter shall be routinely monitored to ensure there have been no breaches in the security.

18. Large, clear, and visible signs are posted on all entry ways restricting access to the site. The signs will depict appropriate emergency contact information.

19. All essential utilities for maintenance of the site are conveyed to ADEQ.

20. Any other actions deemed necessary and appropriate to abate or prevent releases from the site that are likely to create an imminent threat to human health or the environment.

21. Nothing in this Order shall limit the rights of ADEQ to issue further orders or to pursue any further enforcement actions for remediation, penalties and/or costs from any applicable party.

DATED THIS 15th day of October, 2002.

Marcus C. Devine, Director

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MEMORANDUM

SUBJECT: Request for Removal Action at the Cedar Chemical Corporation Site
West Helena, Phillips County, Arkansas

FROM: Gary W. Moore, On-Scene Coordinator
Response and Prevention Branch (6SF-R2)

THRU: Charles A. Gazda, Chief
Response and Prevention Branch (6SF-R)

TO: Myron O. Knudson, P.E.
Director, Superfund Division

I. PURPOSE

This Memorandum requests and documents the approval of a time-critical removal action as authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9604 at the Cedar Chemical Corporation Site (hereinafter referred to as the "Site"). The general scope of the removal action will be to remove and dispose of hazardous substances located on-site.

The actions described in this memorandum meet the criteria for initiating a removal action under Section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR § 300.415.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS No.: ARD990660649
Category of Removal: Time-Critical
Superfund Site ID No.: 06NH

A. Site Description

1. Removal site evaluation

The site is an abandoned chemical manufacturing facility which was abandoned by a bankruptcy court action on October 18, 2002. The facility consists of six (6) separate processing units, laboratories, a finished goods warehouse, a stormwater pond, a wastewater treatment plant, a spare parts warehouse, a maintenance shop, an administration building and various other buildings on 48 acres. The environmental issues associated with the site include abandoned chemicals, possible buried drums, a constructed drum vault filled with unknown chemicals, ground water contamination, surface and subsurface soil contamination, and an abandoned stormwater and wastewater treatment system. Abandoned chemicals are the only issue that currently require a time-critical removal action.

2. Physical location

The site is located in the Helena-West Helena industrial park in Phillips County, Arkansas just south of West Helena, Arkansas. The physical address for the facility is 49 Phillips Road 311, Helena, Arkansas 72342. The site is bounded by Arkansas Highway 242 to the northwest, the Union Pacific railway to the northeast, and other industrial park properties to the southeast and southwest. The land across Highway 242 is agricultural. Residential areas are located within one half mile southwest and northeast of the site.

3. Site characteristics

The site is a defunct chemical manufacturing facility which was abandoned in a bankruptcy court action on October 18, 2002. The facility was originally constructed in 1970 as a propanil manufacturing facility. In 1971, the company was sold to J.A. Williams, which transferred the plant to Eagle River Corporation, a company controlled by Ansul Company. At this time, the company began producing Dinoseb. In 1972, Ansul sold its interest in Eagle River Corporation back to J.A. Williams and the company was merged into Vertac Chemical Company. Vertac Chemical Company owned the facility until 1986, producing propanil and several products for other chemical companies, as a toll manufacturer. The contracted products included, but were not limited to, various herbicides, alkyl phenols, and arsenical compounds. Cedar Chemical Corporation acquired the facility in 1986. Trans Resources, Inc. purchased Cedar Chemical Corporation in 1988 and from then until the facility was abandoned, it produced propanil and continued to perform toll manufacturing, producing various herbicides and nitroparriffin derivatives. In 1991, Cedar Chemical Corporation constructed a processing unit to manufacture dichloroaniline, the active ingredient in propanil. See Enforcement Attachment for additional confidential discussion.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

There have been documented releases of hazardous substances as well as a current continued threat of further releases of hazardous substances into the environment from this facility.

In 1991, Cedar Chemical Corporation entered into a Consent Administrative Order (CAO) under a RCRA corrective action order with the Arkansas Department of Environmental Quality (ADEQ) to conduct a removal of buried drums discovered during facility construction activities. In addition, this CAO required a plant-wide facility investigation. The final investigation report was submitted in 1996 and a risk assessment was completed in 2001. Cedar Chemical Corporation was in the process of preparing a corrective action workplan at the time Cedar Chemical Corporation filed for Chapter 11 bankruptcy. Cedar Chemical Corporation laid off the majority of its employees on March 8, 2001, and began mothballing the facility. Cedar Chemical Corporation was unable to complete those activities by the time the facility was abandoned. As a result, the corrective actions that were identified through the ADEQ CAO were never initiated in addition to the fact that chemicals were abandoned on the facility. A complete inventory of the hazardous substances that remain on the facility has not been determined. Cedar Chemical Corporation has provided a list of some of the chemicals believed to be present at the facility. These hazardous substances include, but are not limited to, acetic acid, benzoic acid, carbon tetrachloride, butylamine, 4-chloroaniline, 2-chloroethyl ether, copper, copper cyanide, cumene, 2,6-dichlorobenzonitrile, 1,2-dichloroethane, dichlorotoluene, Dimethyl sulfate, 2,4-dinitrotoluene, diphenylamine, ethylamine, ethylene oxide, formic acid, formaldehyde, hexachlorobenzene, hyrofluoric acid, nitrobenzene, p-nitrobenzene, pentachloronitrobenzene, potassium cyanide, pyridine, quinoline, sodium cyanide, sodium fluoride, sodium nitrite, 1,2,4-trichlorobenzene, triethylamine, zinc. All of these chemicals are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and 40 CFR § 302.4.

The mechanisms for releases in the past were a result of spills, or intentional releases to the ground. The current potential for releases may occur primarily through vandalism, fire, natural disaster, or deterioration of containers, equipment, or piping. The facility is fenced, but gaps exist around the rail spur which could allow access to the property. The ADEQ is currently providing security through a private security company to keep trespassers from entering the facility and causing a release.

5. NPL status

The Site is not currently on the National Priorities List (NPL). The EPA is currently conducting an evaluation based upon existing data to determine if this site would possibly rank on the NPL.

6. Maps, pictures and other graphic representations

Attachment 1: Map Identifying Location of Facility
Attachment 2: Map of Facility
Attachment 3: Enforcement Attachment

B. Other Actions to Date

1. Previous actions

There has not been a previous EPA removal action relative to this site.

2. Current actions

The owner, Cedar Chemical Corporation, prior to the abandonment of the facility conducted a substantial removal of chemicals from the facility. The company was unable to complete these actions prior to the abandonment, and those chemicals remain on-site. Upon the abandonment of the facility, ADEQ hired a security company to provide security at the facility to prevent any potential vandalism which could result of a release of hazardous substances until such time as the remaining chemicals could be removed.

C. State and Local Authorities' Roles

1. State and local actions to date

To date, the ADEQ is providing security for the facility. In addition, the ADEQ is conducting some testing of the stormwater and wastewater treatment ponds to determine what actions, if any, will be necessary to addressed those waters prior to any overflow. The ADEQ is also in the process of identifying and issuing letters to parties that may have some liability in an attempt to get their participation in the overall cleanup of the site.

2. Potential for continued State/Local response

After the completion of the EPA removal action described above the following environmental issues will remain: potential overflows of stormwater and wastewater treatment ponds; surface/subsurface soil contamination; the drum vault; ground water contamination; and, other buried drums. These issues will not be address as part of this removal action. The EPA will address the laboratory chemicals, abandoned product, abandoned raw materials, and other miscellaneous chemicals.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

Actual or potential exposure to nearby human populations or the food chain from hazardous substances or pollutants or contaminants: Residential properties are located approximately one half mile to the southwest and northeast of the site. There is a potential exposure to human populations which could result from a fire which could spread the combustion byproducts through the air over the residential areas. In addition, there is a potential exposure to trespassers who may enter the property and be exposed to chemicals and contaminated soils.

Actual or potential contamination of drinking water supplies: According to a company Facility Investigation Report dated June 28, 1996, several domestic wells and irrigation wells were identified within a one mile radius of the site; however, all of the domestic wells identified were no longer being used. According to the ADEQ, this alluvial aquifer is known to be used for drinking water and currently meets recognized aquifer classifications as a drinking water aquifer even though the ground water is currently only used for irrigation wells in the immediate vicinity of the site.

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release: There are hazardous substances in on-site drums. It is believed that hazardous substances also remain in equipment and piping in the process units, as well as abandoned products and miscellaneous chemicals scattered throughout the facility. A release could occur through equipment or piping failure, vandalism, or fire. The hazardous substances are listed in II.A.4. above.

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate: There is widespread surface/subsurface soil contamination on the facility due to historical spills and disposal practices on the site. The primary contaminant is Dinoseb at concentrations that exceed 2%. At this time, it does not appear that this contaminant is migrating offsite.

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released: The site is an abandoned chemical manufacturing facility. The ADEQ is currently providing security until the chemicals located on the facility can be removed. The tanks, piping, and equipment are currently in satisfactory condition, but if left unattended, will begin to deteriorate. Lightning strikes, heavy rains or corrosion could rupture equipment or piping and result in a release of hazardous substances to the environment which could cause evacuations and potential exposures that may be harmful to human health and the environment.

Threat of fire or explosion: The site is not currently being maintained. A lightning strike or vandalism could result in a serious fire at this abandoned chemical plant. In any event, a fire may require the evacuation of nearby residents and result in contamination of the environment.

The availability of other appropriate Federal or State response mechanisms to respond to the release: There are no other response mechanisms that could address the chemical hazards posed by the containerized hazardous substances on this site in a timely manner. The ADEQ does not currently have the resources to address the containerized hazardous substances. The EPA will coordinate with the state and local government on this response action and will work with them to identify those areas where they may be able to participate.

Other situations or factors that may pose threats to public health or welfare of the United States or the environment: Failure to address these hazardous substances may result in a more significant off-site migration of these substances and materials, thereby creating a larger and more costly response action, and posing a greater impact on human health, welfare, or the environment.

B. Threats to the Environment

There is not enough information currently available to sufficiently characterize potential impacts to the surrounding ecosystems.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, or pollutants or contaminants from this site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The intent of this action is to remove and dispose of chemicals left on-site. Those chemicals include various laboratory chemicals, chemicals remaining in tanks, piping, and equipment, chemicals remaining in warehouses, and other chemicals scattered throughout the facility. As a result of this action, it may be necessary to damage and/or demolish the tanks, piping, and equipment in order to effectuate this activity.

Asbestos Inspection and Abatement: It will be necessary to conduct an Asbestos Inspection prior to disturbing any potentially containing asbestos materials. Abatement will only be conducted on those areas necessary to conduct the cleanup activities.

Assessment and Removal of Hazardous Substances, or Pollutants or Contaminants: The materials will be tested to determine the appropriate disposal technique.

Decontamination of Containers, Equipment, Piping, and Buildings: The EPA will decontaminate all containers, equipment, piping, and buildings to the extent necessary to remove contaminants that may pose a risk for exposure.

2. Applicable or relevant and appropriate requirements (ARARs)

This removal action will be conducted to eliminate the actual or potential release of a hazardous substance, pollutant, or contaminant to the environment, pursuant to CERCLA, 42 U.S.C. § 9601 et seq., and any oil pursuant to the CWA 33 U.S.C. § 1251 et seq., in a manner consistent with the NCP, 40 C.F.R. Part 300. As per 40 C.F.R. § 300.415(i), Fund-financed

removal actions pursuant to CERCLA Section 104, 42 U.S.C. § 9604, and removal actions pursuant to CERCLA Section 106, 42 U.S.C. § 9606 and the CWA 33 USC § 1321, shall, to the extent practicable considering the exigencies of the situation, attain the applicable or relevant and appropriate requirements under Federal environmental law, including the Toxic Substance and Control Act (TSCA), 15 U.S.C.§ 2601 et. seq., the Safe Drinking Water Act (SDWA), 42 U.S.C. § 300 et. seq., the Clean Air Act (CAA), 42 U.S.C. § 7401 et. seq., Clean Water Act (CWA), 33 U.S.C. § 1251 et. seq., the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et. seq., or any promulgated standard, applicable or relevant and appropriate requirements, criteria, or limitation under a state environmental or facility citing law that is more stringent than any Federal standard, requirement, criteria, or limitation contained in a program approved, authorized or delegated by the Administrator and identified to the President by the state.

Due to the fact that consolidation and off-site disposal are the principal elements of this removal action, RCRA waste analysis requirements found at 40 C.F.R. §§ 261.20 and 261.30, RCRA manifesting requirements found at 40 C.F.R. § 262.20, and RCRA packaging and labeling requirements found at 40 C.F.R. § 262.30 are deemed to be relevant and appropriate requirements for this removal action. Because on-site storage of hazardous wastes by EPA is not expected to exceed ninety days, specific storage requirements found at 40 CFR Part 265 are not applicable or relevant and appropriate. See 40 CFR § 262.34. All hazardous substances, pollutants, or contaminants removed off-site for treatment, storage, or disposal shall be treated, stored, or disposed at a facility in compliance, as determined by the EPA, pursuant to 40 CFR § 300.440. All off-site transportation of hazardous materials will be performed in conformity with U.S. Department of Transportation (DOT) requirements at 49 CFR § 172.

Additionally, since this response may require demolition activities that may involve asbestos-containing material (ACM), the EPA will, to the extent practicable considering the exigencies of the situation, attain the applicable or relevant and appropriate requirements contained in 40 CFR § 61.

3. Project schedule

The EPA expects to initiate removal actions within 6 months of approval of this Action Memorandum.

B. Estimated costs

Extramural Costs:

Contractor	CERCLA Funds
Cleanup Contractor	$ 439,000
START	$ 101,000
Total Extramural	$ 540,000
Site Contingency (20%)	$ 108,000
TOTAL PROJECT CEILING	**$ 648,000**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If action is not taken at the Site, the natural degradation of the facility will continue until a catastrophic release of the hazardous substances located at the site occurs; or until a fire occurs which engulfs the chemicals on the site. Such a fire could lead to the releases of hazardous substances into the air which could result in residential evacuations. Additionally, trespassers and vandals could open valves, damage containers, or start a fire which could result in releases to the ground and to the air. A release from this Site could result in exposure to human populations. Since the facility is abandoned and no continuing maintenance is being conducted, it is continuing to deteriorate. Such deteriorations could eventually result in releases of hazardous substances should the proposed actions not be implemented.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this action.

VIII. ENFORCEMENT

See Attachment 3

IX. RECOMMENDATION

This decision document recommends the selected removal action under CERCLA for the Cedar Chemical Corporation Site, West Helena, Phillips County, Arkansas developed in accordance with CERCLA, 42 U.S.C. § 9601 et. seq., and is not inconsistent with the NCP, 40 CFR § 300. This decision is based on the Administrative Record for the Site. Because the conditions at the Site meet the criteria defined in Section 300.415 and 300.305 of the NCP, I recommend your approval of the proposed removal action. The total CERCLA extramural project ceiling if approved will be $ 648,000. Of this, an estimated $ 439,000 will come from the CERCLA removal allowance.

APPROVED: Wayne O. Kamida DATE: 1/16/03

SUPERFUND BRANCH
OFFICE OF REGIONAL COUNSEL
U.S. EPA REGION 6

1445 Ross Avenue, Ste. 1200
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Telephone No. (214) 665-2134, 2135
Telefax No. (214) 665-6460

FACSIMILE TRANSMISSION

FROM: Jim Turner (214) 665-3159

TO: Dan Etzkorn ADEQ. Ext. 0888

SUBJ: Cedarchem.

COMMENTS: See attached CERCLA Action Memo.

Fax # 501.682.0891

TOTAL NO. PAGES: 9

SENT BY: Jim DATE/TIME 2/6/03

United States Environmental Protection Agency
Region 6
POLLUTION REPORT

Date: Wednesday, July 16, 2003
From: Gary W. Moore, OSC

Subject: Initiation of Action
Cedar Chemical Corporation Site
49 Phillips Road 311, Helena, AR

POLREP No.:	1	**Site #:**	06NH
Reporting Period:		**D.O. #:**	
Start Date:	7/16/2003	**Response Authority:**	CERCLA
Mob Date:	7/16/2003	**Response Type:**	TC
Completion Date:		**NPL Status:**	Non NPL
CERCLIS ID #:	ARD990660649	**Incident Category:**	Removal Action
RCRIS ID #:	ARD990660649	**Contract #**	

Site Description
The Site is an abandoned specialty chemical manufacturing facility located in West Helena, Arkansas which was abandoned in a bankruptcy court action on October 18, 2002. The facility is located on 48 acres and consists of six (6) separate processing units, laboratories, a finished goods warehouse, a stormwater pond, a wastewater treatment plant, a spare parts warehouse, a maintenance shop, an administration building and various other buildings.

The environmental issues associated with the Site include abandoned chemicals, potentially buried drums, a constructed drum vault filled with unknown chemicals, ground water contamination, surface and subsurface soil contamination, and an abandoned stormwater and wastewater treatment system.

Current Activities
The EPA mobilized its START Contractor to the Site on 7/16/03 to begin the process of inventory, hazcatting, segregation,and packaging the laboratory and miscellaneous chemicals located throughout the facility.

Planned Removal Actions
The planned removal actions are to remove and dispose of the abandoned chemicals in the laboratory, chemicals located in the warehouses, other miscellaneous chemicals located on the facility, and those chemicals located within tanks, equipment, and piping.

Next Steps
On the week of 7/28/2003, the EPA will mobilize its ERRS Contractor to begin the process of removing chemicals from tanks, equipment, and piping followed by the disposal of all the materials generated in this action.

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining

Extramural Costs				
ERRS - Cleanup Contractor	$400,000.00	$0.00	$400,000.00	100.00%
START	$156,400.00	$0.00	$156,400.00	100.00%
Intramural Costs				
Total Site Costs	$556,400.00	$0.00	$556,400.00	100.00%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

www.epaosc.net/cedarchemical

United States Environmental Protection Agency
Region 6
POLLUTION REPORT

Date: Monday, August 18, 2003
From: Gary W. Moore, OSC

To: Site File, U.S. EPA Region 6
Mike Cook, USEPA - OERR
Charles Gazda, U.S. EPA Region 6

Subject: Continuation of Removal Activities
Cedar Chemical Corporation Site
49 Phillips Road 311, Helena, AR

POLREP No.:	2	**Site #:**	06NH
Reporting Period:	July 16 - August 15	**D.O. #:**	
Start Date:	7/16/2003	**Response Authority:**	CERCLA
Mob Date:	7/16/2003	**Response Type:**	TC
Completion Date:		**NPL Status:**	Non NPL
CERCLIS ID #:	ARD990660649	**Incident Category:**	Removal Action
RCRIS ID #:	ARD990660649	**Contract #**	

Site Description

The Site is an abandoned specialty chemical manufacturing facility located in West Helena, Arkansas which was abandoned in a bankruptcy court action on October 18, 2002. The facility is located on 48 acres and consists of six (6) separate processing units, laboratories, a finished goods warehouse, a stormwater pond, a wastewater treatment plant, and other administrative and operational buildings.

The environmental issues associated with the Site include abandoned chemicals, potentially buried drums, a constructed drum vault filled with unknown chemicals, ground water contamination, surface and subsurface soil contamination, and an abandoned stormwater and wastewater treatment system.

Current Activities

The EPA mobilized its START Contractor to the Site on 7/16/03 to conduct an inventory of chemicals, hazcat unknowns, and segregate the laboratory chemicals in the proper disposal classification.

The EPA mobilized its ERRS Contractor on 7/28/03 to begin evacuating chemicals from tanks, equipment, and piping; and, disposal of all chemicals. During the week of 8/11/03, the lab chemicals were packaged and transported offsite for disposal.

The EPA made contact with Helena Chemical, BPS, and Norac prior to the disposal of the laboratory chemicals to see if they needed any for their on-site labs. Only Helena Chemical came by and picked up some of the lab chemicals.

There is a significant quantity of calcium chloride within onsite tanks. The calcium chloride was a raw material used in the chemical processing. The EPA has contacted DOW about reuse possibilities of the product and they set us up with a distributor of their product, Sicalco, Ltd. that

was interested in the product. The EPA analyzed the material and the distributor indicated that it meets their specifications for use. The company intends to offer this material for use as roadway dust control which is a known common usage for the material.

The EPA has made contact with Praxair, Atofina, and Cymetech to return gas cylinders that belong to them. The materials are Forane 22, and Silicon tetrachloride.

Planned Removal Actions

The planned removal actions are to remove and dispose of the abandoned chemicals in the laboratory, chemicals located in the warehouses, other miscellaneous chemicals located on the facility, and those chemicals located within tanks, equipment, and piping.

Next Steps

The next steps include the continuing evacuation of chemicals from the tanks, equipment, and piping as well as the disposal of the chemicals generated from this activity and those located in the warehouse.

It is important to understand that the removal of chemicals from the tanks, equipment, and piping is a slow and expensive process and has not resulted in the recovery of a significant quantity of materials to date. It is anticipated that this process will be continued but will be evaluated to determine the cost benefit in light of the low volume of material being recovered.

Key Issues

The ADEQ was contacted relative to drums of oil located on the property. ADEQ agreed that the oil could be left onsite rather than disposed.

The ADEQ was also contacted about the drummed acids that are located in the warehouse. ADEQ indicated that they could possibly need those for pH adjustment for the wastewater treatment plant discharge and would let me know if they would like to keep them on-site.

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
Intramural Costs				
Total Site Costs	$0.00	$0.00	$0.00	0.00%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

www.epaosc.net/cedarchemical

CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

ATTACHMENT C

APPRAISAL REVIEW

ADEQ

ARKANSAS
Department of Environmental Quality

CEDAR CHEMICAL APPRAISAL REVIEW

The Cedar Chemical Plant located at 49 Phillips Road (Route 311), West Helena, Arkansas was inspected and appraised for the total Fair Market Value in the area of machinery and equipment and in the area of real property and standing structures.

The chemical plant includes approximately 48 acres and includes 562 pieces of equipment and machinery (including the waste water treatment system). The appraisal reports the Fair Market Value of the equipment and machinery, as of June 2003, to be approximately 5.2 million dollars.

The real property appraisal consists only of the real estate, office building, packaging and warehouse building, two separate laboratory buildings and several other shop and storage buildings. The total value for the property, excluding the chemical production facilities and machinery, is approximately 1.2 million dollars.

The total combined Fair Market Value for the Cedar Chemical Plant (excluding any environmental issues) is approximately **6.4 million dollars**.

HAZARDOUS WASTE DIVISION
8001 NATIONAL DRIVE / POST OFFICE BOX 8913 / LITTLE ROCK, ARKANSAS 72219-8913 / TELEPHONE 501-682-0833 / FAX 501-682-0565
www.adeq.state.ar.us

CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

ATTACHMENT D

RISK EVALUATION REPORT

CEDAR CHEMICAL

RISK LEVELS WHICH MUST BE MET IN THE PLANS OF PROSPECTIVE PURCHASERS

There are two distinctly different types of risk to consider:

1) Risk to Degrade Groundwater

2) Risk to Human Health and the Environment

I. Risk Levels Which Must be Met:

A. Human Health and the Environment

1. The acceptable human health risk levels for the sum of all applicable pathways and routes of exposure for all applicable human receptors are:

   a. Excess Lifetime Cancer Risk Range: 10^{-4} to 10^{-6}

   b. Non-cancer Hazard Level: cumulative HI of 1, or HI per Target Organ of 1

2. Ecological Risk Levels: As long as stormwater discharge is covered by NPDES permit, ecological risk standards appear to be not applicable.

B. Risk to Degrade Groundwater

Since any area of subsurface soil which exceeds applicable DAF screening levels represents a risk to degrade groundwater, prospective purchasers' plans should include provisions to implement corrective measures or risk management controls for all areas where active migration to groundwater is taking place. Groundwater will continue to be degraded if such areas are allowed to remain exposed to infiltration and infrastructural sources delineated in Section II are not properly remediated or managed such that no more source or subsurface contaminants are allowed to migrate to groundwater.

II. <u>Basic Corrective Measures</u> and <u>Risk Management Controls</u> Needed <u>to Prevent the Actual or Potential further Degradation to Groundwater</u> if Land Use and Site Structures Remain as they Currently are:

A. <u>Wastewater Treatment Plant Ponds</u> - Due to mounding reported around the WWTP and contaminants being reported in current and historical groundwater

samples, there is a significant concern that the ponds may be actively leaking into the groundwater. Prospective purchasers' plans should include provisions to demonstrate whether the ponds are leaking or not. If they are not leaking, leak detection capabilities should be provided. If they are leaking, a corrective measure such as retrofitting the ponds with synthetic liners and providing leak detection capabilities should be implemented in accordance with ADEQ approval.

If the ponds are no longer to be utilized, a risk management technique such as filling and capping with an impermeable cap such as a two foot engineered clay cap, a synthetic HDPE liner, topsoil and vegetation, could be used to prevent risk of degradation to groundwater and unacceptable risk levels for on-site construction workers. The specific corrective measures or risk management controls (institutional or engineered) to be used at this site will depend on the planned land use with respect to these ponds.

B. **Tank Secondary Containment Areas** – Due to leakage observed from tank containment areas by ADEQ personnel, prospective purchasers' plans should include provisions to repair or reconstruct tank secondary containment areas that are not capable of containing a spill to minimize the potential for further degradation. These improvements/reconstruction should be done in accordance with ADEQ approval. Although the groundwater protection protection standard, as quantified in Regulation 23, § 264.94 would normally apply where clean groundwater exists, since the groundwater associated with the site is already significantly contaminated, the more appropriate standard for releases from these units should be *de minimus* loss.

C. **Process Containment Areas** – Since curbing in these areas have been observed to leak during precipitation events and concrete process sumps are a suspected source of groundwater contamination in this area, prospective purchasers' plans should include provisions for all curbing, containment areas and process sumps to be improved where necessary to minimize the potential for further degradation. Such improvements should be made with ADEQ approval.

D. **Underground Piping** – Since the underground piping was determined to be a major source of contamination in the facility investigations, prospective purchasers' plans should include a provision for eliminating underground wastewater piping within 1 year of acquiring the property, to minimize the potential for further degradation of soil and groundwater (Facility Investigation Status Report, March 12, 1996).

In addition, historical knowledge indicates that a considerable length of wastewater piping was constructed above ground between the main portion of the Process Area and the Wastewater Treatment Plant. The same knowledge indicates that the old piping was left in the ground full of wastewater and that no attempt was ever made to properly close and remove this line. Since this is very

likely a continuing source of contamination, it should be closed and removed according to ADEQ requirements. A good reference source of criteria for removing and closing this underground piping is Regulation 23, § 264.197.

E. **Construction Activities** - Due to contaminated soil and perched groundwater, a soil management plan and health and safety plan should be developed for construction activities. The Health and Safety Plan (HASP) should include all applicable components necessary to ensure the health and safety of the construction workers involved which may include the following sections: Intro, Key Personnel, Task Safety and Health Risk Analysis, Personnel Training Requirements, Personal Protective Equipment Program, Medical Surveillance Requirements, Decontamination Plan, Confined Space Entry Procedures, Spill Contingency Plan and Hazard Communication. The particular HASP developed for use, may depend on the site-specific parameters of the area and the type of construction being done.

In conjunction with the HASP to guard against unacceptable risks during construction activities, it is just as important to develop and submit a soil management plan for all excavated or disturbed soil. All such soil should be sampled to determine if the soil is hazardous waste or if it exceeds risk-based standards. If it is hazardous, it must be managed and disposed of as such. If it exceeds risk-based standards, depending on the extent, there are only limited ways in which it could be used on site. If it does not exceed risk-based standards, it can be used on the site for any beneficial use except in wetland areas. This plan should include a section on best management practices for managing the soil during post-excavation activities.

F. **Stormwater Management System** – Because of excessive stormwater retention in the existing system, there is a high potential for contaminants to be released into the soil and migrate to groundwater from this source. Prospective purchasers' plans should include a provision for upgrading the stormwater management system to minimize the retention which will, in turn, minimize potential for further degradation of groundwater.

If the large stormwater ditch and three wide ditches connected thereto, are to continue to be used as retention basins for the Wastewater Treatment Plant Ponds, the prospective purchasers plans should include provisions to demonstrate whether they are leaking or not, and if so, provide for the corrective measure of retrofitting the pond and ditches with an applicable impermeable synthetic liner and leak detection capabilities to detect and forestall any future leaks from these structures.

If the stormwater pond and associated three ditches are no longer needed to retain stormwater due to an upgrade on the Waste water Treatment Ponds or any other reason making retention in these structures completely unnecessary, it is possible then that all the sediments would simply have to be removed, managed and

disposed as hazardous waste, which would minimize the potential for further degradation of the groundwater from these units. The risk-based clean-up levels for the dry sediment constituents are:

- arsenic 18 mg/Kg
- Aldrin 1.1 mg/Kg
- Dieldrin 1.2 mg/Kg
- Toxaphene 17 mg/Kg
- Pentachlorophenol 100 mg/Kg
- Dinoseb 680 mg/Kg
- Propanil 3,400 mg/Kg

III. Contaminated Sites within Property Boundaries which do not Meet Acceptable Risk Levels Described in Section I. and II. Summary of sites with unacceptable levels of contamination as per August 15, 2000 Risk Assessment:

TABLE 1

Site *	Site Name	Media & Chemicals of Concern	Human Receptor	Hazard Index
Site 1	Wastewater Treatment Ponds	Sediment-Arsenic	Current or Future Construction Worker	21
Site 2	Former Wastewater Treatment Ponds	Subsurface Soil - 1,2-dichloroethane	Current or Future Construction Worker	9
Site 3	Stormwater Ditches	Subsurface Soil - Dinoseb	Current Future Construction Worker	40
Site 4	Rail Spur Loading/Unloading Area	Surface Soil-Dinoseb Subsurface Soil- 3,4-dichloroaniline, Dinoseb	Current or Future Construction Worker	13
Site 8	Ditch by Wastewater Treatment Area	Surface Soil - arsenic	N/A	Did not exceed Residential MSSL's
Site 9 (Site 5- Drum Vault & Site 6- Yellow stained Area are both within or integrated with Site 9 and will be treated as such; see text below)	Former Dinoseb Disposal Ponds	Suface Soil – Dinoseb, Propanil Subsurface Soil – 3,4-dichloroaniline, Dinoseb and Propanil	Current or Future Construction Worker	91
			Current or Future On-Site Worker	254
			Future Trespasser	82

*** See Figure 1 for location of these Specific Sites within Cedar Chemical Property.**

RISK SUMMARY FOR EACH CONTAMINATED SITE (See Table 1 above) EXCEEDING HUMAN HEALTH RISK STANDARDS

A. Site 1 – Wastewater Treatment Ponds

Chemicals of Concern – arsenic in the sediment

Cancer Risk: Acceptable

Non-Cancer Risk to Future Construction Worker-

Cumulative Hazard Index : 21

Potential Corrective Measure or Risk Management Control: Due to mounding reported around the WWTP and contaminants being reported in current and historical groundwater samples, there is a significant concern that the ponds may be actively leaking into the groundwater. Prospective purchasers may wish to determine more empirically whether the ponds are leaking or not. If they prove to be leaking, installing a HDPE synthetic liner and leak detection capabilities in conjunction with other risk management controls would minimize the potential for further degradation of the groundwater.

If ponds are no longer to be utilized and are found to be leaking, they should be sealed off from any further infiltration to soil and migration to groundwater. This could be accomplished by backfilling, capping with an engineered clay cap, installing an impervious HDPE synthetic liner, top soil and vegetation in accordance with ADEQ approval. This, too, would minimize the potential of further degradation to groundwater.

B. Site 2 – Former Waste Treatment Ponds

Chemicals of Concern – 1,2-dichloroethane in Subsurface Soil

Cancer Risk: Acceptable

Non-Cancer Risk to Future Construction Worker-

Cumulative Hazard Index: 9

Potential Corrective Measure or Risk Management Solution: Numerous Studies and Sampling events (documented in the ADEQ's May 2003 Comprehensive Site Assessment of Cedar Chemical) conducted over the course of ADEQ's investigation of the Cedar Chemical Site indicate a direct connection between these former Waste Treatment Lagoons and the significant contamination which exists in the associated groundwater. The overriding concern is to ensure that no more infiltration into the soil and migration into the groundwater takes place.

If the land use is to remain the same, installation of an engineered clay cap, an HDPE synthetic liner, top soil and vegetation over the entire site would minimize the potential for further degradation of groundwater.

If a new building is planned to be constructed within this site, construction workers would have to use appropriate PPE, and an impervious liner (Clay, HDPE, or other high tech liners) would have to be placed not only under the building but wrap up the sides of the building to ground surface. This would protect occupants from vapor intrusion into indoor air. The remainder of the site would have to be sealed as described in the above paragraph. Both of these suggestions would minimize the potential for further degradation of groundwater from this site.

C. **Site 3 – Stormwater Ditches**

Chemical of Concern – Dinoseb in Subsurface Soil

Cancer Risk: Acceptable

Non-Cancer Risk to Future Construction Worker –

Cumulative Hazard Index: 40

Potential Corrective Measure or Risk Management Control: If the only risk concern was with respect to the future construction worker, an institutional control requiring appropriate PPE for all construction workers working in this site would suffice to protect their health. However, there is a more long range risk concern that may take precedence over this. Please refer to text in II. F. regarding these retention ditches and associated receiving ditch. The concerns with respect to risk to degrade groundwater must be adequately addressed before a simple institutional control will suffice. If ditches are no longer used for retention of stormwater, removal and proper management of all sediments would remove any surface contact risk. See clean-up levels provided in II. F. above.

D. **Site 4 – Rail Spur Loading/Unloading Area**

Chemicals of Concern – Dinoseb in Surface Soil
3,4-dichloroaniline & Dinoseb in Subsurface Soil

Cancer Risk: Acceptable

Non-Cancer Risk to Future Construction Worker –

Cumulative Hazard Index: 13

Potential Corrective Measure or Risk Management Solution: Since the Sampling results in ADEQ's May 2003 Comprehensive Site Assessment indicate that there is no continuing source and no measurable migration, the main risk concern with respect to this unit is that of the future construction worker or anyone else who may dig in this area. These risk can be handled by risk control measures one of two ways. Place a no-dig restriction in the deed of this property for this particular area or place an institutional control on the facility requiring appropriate PPE for all workers who dig in this area. Proper soil management practices as detailed in facility soil management plan would also have to be followed whenever digging occurs. See more detailed explanation of components of soil management plan as provided in II. E. above.

E. **Site 9 – Former Dinoseb Disposal Ponds (and Site 5 – Drum Vault and Site 6-Yellow Stained Area)**

Chemicals of Concern – Dinoseb and Propanil in Surface Soil

3,4-dichloroaniline, Dinoseb and Propanil and unknown constituents in Subsurface Soil

Cancer Risk: Acceptable

Non-Cancer Risk to Current or Future On-site worker-

Cumulative Hazard Index: 254

Non-Cancer Risk to Future Trespasser –

Cumulative Hazard Index: 82

Non-Cancer Risk to Future Construction Worker-

Cumulative Hazard Index: 91

Potential Corrective Measure or Risk Management Control : This site is the most contaminated of all the sites at the facility. The former Dinseb ponds were reported to be disposal sites for Dinoseb products and waste materials. Site 5, a buried Drum Vault, containing 200 to 300 drums of unknown material sits, for the most part, within the Former Dinoseb Disposal Ponds and therefore must be considered part of an integrated site (Site 9 and Site 5). Since the contamination levels at Site 9 are so high and a fairly recent unexplained spike in the groundwater contamination has been observed, some of the investigators feel that leakage from the drum vault could be contributing to the contamination at Site 9. Whether it is or it isn't, it is apparent that at some point, the contents of these drums will be released into the environment, further exacerbating the degradation that has already occurred. Prospective purchasers should provide provisions in

their plan to locate and remove these drums before additional serious degradation occurs.

At some point in the investigation, another area described as the yellow stained area was identified and labeled Site 6. This area is relatively small and completely encompassed within Site 9. This area also must be considered part of this integrated site (Site 9, Site 5 and Site 6) for any corrective measures or risk management controls implemented. Five different herbicides/pesticides were found in Site 6 subsurface soil which exceeded residential screening levels. Although due to its nature, Site 5 will likely require excavation and removal, it appears that the remedy used for Site 9, will also suffice for Site 6.

As far as the remainder of the Former Dinoseb Disposal Ponds Integrated Site is concerned, there are three human receptors at risk (Trespasser, Outdoor Worker and Future Construction Worker) and a serious on-going threat to further degrade groundwater. ADEQ geologists on this project indicate that the contamination at this site begins at ground surface and continues all the way down to the alluvial aquifer where a LNAPL (Light Non-Aqueous Phase Liquid) source quite likely is sitting on top of the aquifer. For this reason, removing soil to a specified clean-up level would be a futile effort, because the deeper you dig the higher the concentration is likely to be. Even if one backfilled after significant removal, there would still be the overriding concern regarding on-going infiltration into groundwater which would need to be addressed.

Given the above, it seems that the options are limited. To ensure against continuing infiltration to groundwater and at the same time provide protection to the human receptors mentioned above, the entire Site 9 area should be capped with an impermeable cap (such as an engineered clay liner, an HDPE synthetic liner, topsoil and vegetation) and a no-dig deed restriction for this area should be implemented. Although this would control the risk (human risk and further risk to degrade groundwater), if there is source material sitting on the alluvial aquifer, the groundwater would continue to be degraded.

IV. Ecological Risk:

The Ecological Risk Evaluation identified three areas of concern. Area I consists of three on-site ditches which retain stormwater. Area II consists of a 2 acre isolated constructed wetland on the southwest boundary of the property. Area III includes all adjacent off-site areas. The evaluation found that none of these areas presented an unacceptable risk to ecological receptors (Risk Assessment; Cedar Chemical; EnSafe; August 15, 2000). The main concern was with Area II, the constructed wetlands on the southwest boundary of the property. It began as a constructed overflow retention pond, but was never used as such. Over the years it developed into a wetland area with all the biota associated with such. Due to the diversity of life forms expected in a wetland area, there was concern about potential adverse affects of the plant operation. Close inspection of the area

between the wetland and the plant area by both EnSafe, Cedar and ADEQ personnel indicates that there is no connection between the two, therefore no potential of risk.

V. Conclusion Regarding "Clean-up Levels":

Surface Soil Clean-Up Levels – Of all the sites identified for further study in the RCRA Facility Investigation (RFI) and Risk Assessment, none of the sites indicated surface soil contamination in excess of risk based standards, except Site 9, the Former Dinoseb Disposal Ponds and Site 4, the Rail Spur Loading/Unloading Area. Developing surface soil risk-based clean-up levels would, then, be meaningless for every site, because 5 out of 6 of them already meet applicable industrial surface soil standards (except for a digging scenario at Site 4). With respect to integrated Site 9,5,6 (the Former Dinoseb Disposal Ponds, the Drum Vault and the Yellow Stained Area), as alluded to in the text of III. E., since the contamination starts at ground surface and continues all the way the alluvial aquifer, once again a surface soil risk-based clean-up level would be moot, in that the deeper one digs the more concentrated the contamination becomes. Even if it could somehow be applied in a rational way, the overriding problem of infiltration to groundwater would still have to be addressed.

Subsurface Soil Clean-up Levels – Ordinarily the subsurface clean up levels would be dictated by the appropriate DAF level for each constituent. However, in the Cedar Chemical Situation, normal DAF levels may no longer apply due to the longevity of the infiltration to groundwater and how that has affected soil chemistry. Because of the continued sourcing from on site structures, and some of the 8 sites specifically discussed in this document, it would be economically infeasible to clean up all subsurface soil to the appropriate DAF numbers. As soon as an area was cleaned up to the applicable level, it would simply be recontaminated by continuing sourcing, migration and infiltration from above.

Future Groundwater Monitoring Program – After all the corrective measures and risk management controls discussed herein have been implemented and some time has passed, the selected purchaser should install a groundwater monitoring system, in accordance with ADEQ approval, to establish a baseline and monitor what should be declining values over time. Plans for such a groundwater monitoring system would be submitted for ADEQ approval before installation could begin.

CEDAR CHEMICAL COMPANY:
REQUEST FOR PROPOSALS PACKET

ATTACHMENT E

PROSPECTIVE PURCHASERS' RANKING CRITERIA

Arkansas Brownfields program

CEDAR CHEMICAL CORPORATION PROSPECTIVE PURCHASERS' RANKING CRITERIA

The following topics are required to be clearly addressed in your proposal to the Arkansas Department of Environmental Quality (ADEQ) for consideration in purchasing the Cedar Chemical Corporation property. Each candidate will be ranked according to the responses given to the criteria below.

COMPANY INFORMATION

- Please describe your company history, including a timeline.
- Please explain your business plan, including an estimated timeline.
- Is your company a single (unattached) business or part of a larger conglomerate?
- What type of insurance/financial assurance will you have regarding the remediation &/or redevelopment of your project?

REMEDIATION

- Describe your plans for risk-based remediation, if any.
- Describe your plans for the operation of the storm water ponds.
- Describe you plans to address the on- and off-site groundwater contamination.
- The Arkansas Voluntary Cleanup Act (also known as the Arkansas Brownfields Law) A.C.A. §§ 8-7-1101 *et seq* requires that once a prospective purchaser acquires title that responsibility to address releases of hazardous substances be addressed by the purchaser. "Releases" for the purpose of this provision of the statute are described at A.C.A. § 8-7-1104 (h) and can generally be categorized as conditions that present an unacceptable risk to persons and an unacceptable risk to degrade groundwater. The statute further requires that a remedial action "...eliminate unacceptable risks and prevent degradation of groundwater..." *emphasis added* [A.C.A. § 8-7-1104 (h) (2) (i)].

  Currently, the site conditions as we know them include documented groundwater contamination and hazardous substance contamination in the subsurface on site basically from the surface and extending down to the depth of groundwater. These facts present an ongoing risk to degrade groundwater. Therefore, this risk to degrade groundwater must be addressed by any Brownfields participant at the Cedar site. The methods of addressing this degradation risk vary greatly and would be subject to evaluation by the staff of this agency and the Brownfields participant. The prospective purchaser must also address the remediation of off-site groundwater contamination.

  Considering the above information, please explain your plan for the prevention of groundwater degradation as well as the remediation of off-site groundwater contamination.

REDEVELOPMENT

- Briefly explain the proposed business to be conducted at this facility.
- Provide an events timeline for your redevelopment plan, including your estimated date of operations start-up.

- Briefly explain how all or part of the facility, property, &/or infrastructure will be utilized in your business plan.
- Is your company currently conducting a similar type of business elsewhere? Explain.
- Explain your back-up plan, if any, should the redevelopment or business growth not reach the anticipated goals.
- Please describe any marketing strategies for your business/product you may have.

EMPLOYMENT

- Please describe the number and type of jobs you will create, citing the number created immediately and after one/five/etc. year(s) operational.
- Are you planning on hiring locally or from outside the community?
- Explain your job training plan, if any, for your employees.
- What is the anticipated median salary for this business location?

COMMUNITY

- Explain what you feel your company's role will be in the local community.

OFFER

- What is your offer for the Cedar Chemical Corporation site?
- Please describe in detail if this offer includes any financial assurance mechanisms (e.g., an escrow account) to address the environmental remediation at the site.

SUBMITTING YOUR PROPOSAL

- Upon submitting your proposal, you must certify that you have reviewed all of the information provided and it is to the best of your knowledge true, accurate, and complete.
- **The deadline for receipt of proposals for the Cedar Chemical Corp. site is 2:00 p.m. on August 2, 2004.**
- Proposals may be mailed or hand-delivered to the address listed below:

  Arkansas Department of Environmental Quality
  Attn: Amanda Gregory
  8001 National Drive
  Little Rock, Arkansas 72219

For further information please visit http://www.adeq.state.ar.us/cedarchemical.htm or contact Amanda Gregory at (501) 682-0867 or gregory@adeq.state.ar.us.